University of Alberta

Symptom Experiences of Individuals Diagnosed with Vocal Cord Dysfunction with or without Asthma and/or Panic

by

Wendy Anne Heffern ©

A Thesis submitted to the Faculty of Graduate Studies and Research in partial fulfillment of the requirements for the degree of Master of Nursing

Faculty of Nursing

Edmonton, Alberta

Fall 1999

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Abstract

The purpose of this study was to explore the symptom experiences of individuals diagnosed with Vocal Cord Dysfunction (VCD) with or without Asthma and/or Panic. Six subjects were assessed by the researcher using (a) a multiple card sort procedure to identify the constellation, order of presentation, and severity of symptoms experienced by the subjects; and (b) a semi-structured clinical interview to explore subjects' symptom interpretations and symptom management outcomes. The types of symptom episodes investigated included (a) typical "single diagnosis" symptom episodes of VCD, Asthma, and Panic; (b) typical "combined diagnosis" symptom episodes of VCD/Asthma, VCD/Panic, Asthma/Panic, and VCD/Asthma/Panic; and (c) the worst symptom episode the subject ever experienced. The results of the multiple card sort procedure revealed significant symptom differentiation and overlap problems. The interview data revealed the following major themes: (a) suddenness of onset of VCD symptoms; (b) confusion in the patient, health care professional, and public related to interpreting and managing symptoms; (c) propensity for health care professionals to administer inappropriate treatment; and (d) significant impact that VCD has on the daily life activities of the individual.

Acknowledgments

I would like to thank family, friends, and faculty for the support, patience, encouragement, and laughter that enabled me to complete this thesis. The following people were integral to the process, and I owe them my heartfelt appreciation.

To my husband, Terry without whose loving and trusting support I could not have accomplished what I have. You are and will always be my angel. To my treasures, Meghan and Shanna who bring joy and sunshine to my life every day. Your patience and understanding belie your years, and my degree is also yours.

To my father, Bill who gave me the gift of writing and encouraged me always to trust what I feel. To my mother, Pat who never once strayed from the belief that if I am happy, I am a success. To my sister, Trisha whose doses of reality given with loving care taught me to question my motives and be honest with myself. Thank you all for your laughter and your love. It is what renews my spirit.

To my cheerleaders, Marian, Candace and Kim, and my other personal friends who never questioned whether I could succeed and always expected that I would. Thank you for listening and putting up with the highs and the lows. I could not have survived without you.

To my co-supervisor, Dr. Carolyn Ross, for her interest and help with this project. Your time and expertise were very much appreciated. Thank you also to Dr. Brenda Cameron and Dr. Todd Rogers for their time and for agreeing to be on my thesis committee.

Lastly, to my co-supervisor, mentor, and friend, Dr. Terry Davis whose faith in me taught me to have faith in myself.

You have all been part of this journey, and you will all be forever in my heart.

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CHAPTER 1

Introduction

Vocal cord dysfunction (VCD) and its many aliases (episodic laryngeal dyskinesia, functional upper airway obstruction, factitious asthma, emotional laryngeal wheezing, paradoxical vocal cord motion, functional stridor, hysterical stridor, psychosomatic stridor, and spasmodic croup) have been described in the literature since first identified as Munchausen's stridor by Patterson, Schatz, and Horton in 1974. It is characterized by closure of the vocal cords, most often during inspiration, with resultant wheezing, inability to speak, and respiratory distress, although blood gas levels remain normal (Newman, 1993; Ramirez, Leon, & Rivera, 1986). It is also well known as a disorder that mimics asthma (Newman, 1993). Studies have found that patients with VCD presenting to the emergency department in acute respiratory distress are often misdiagnosed with asthma, leading to unnecessary aggressive procedures such as intubation, tracheostomies, and the prescribing of potentially dangerous medications (Corren & Newman, 1992; Freedman, Rosenberg, & Schmaling, 1991; Logvinoff, Lau, & Weinstein, 1990; Martin, Blager, Gay, & Wood, 1987; Nahmias, Tansey, & Karetzky, 1994; Newman, Mason, & Schmaling, 1995; Niven, Roberts, Pickering, & Web, 1992; Wanger & Beam, 1992).

Although there have been a small number of cases where abnormal vocal cord movement has been caused by physical disease, VCD is generally thought of as a psychogenic syndrome because of the typical absence of organic etiology. The difference between functional voice disorders and VCD is that the vocal cords in VCD adduct during inspiration, which is a paradoxical motion that can be seen with fiberoptic nasopharyngoscopic examination. Individuals with aphonia or dysphonia, on the other hand, show normal laryngeal functioning.

Both functional voice disorders and VCD have been diagnosed in the past as conversion reactions precipitated by psychosocial factors and psychodynamic conflict (Barnes, Grob, Lachman, Marsh, & Loughlin, 1986; Christopher et al., 1983; Craig, Sitz, Smith, & Carpenter, 1992; Geist & Tallett, 1990; Harris & Richard, 1992; Lacy & McManis, 1994; Schalen, Andersson, & Eliasson, 1992). As Craig et al. state, "conversion reactions provide a psychological defense for banishing anxiety-provoking, painful, unpleasant mental contents from consciousness, with the substitution of an unconscious hysterical symptom" (p. 614).

Conversion reactions are associated with voluntary motor functioning such as that of the vocal cords during speech. The abnormal vocal cord movement that occurs during nonspeech respiratory activity in VCD, however, is an automatic motor behavior (Dworkin & Meleca, 1997). According to the DSM-IV, "Conversion symptoms typically do not conform to known anatomical pathways and physiological mechanisms, but instead follow the individual's conceptualization of a condition" (American Psychiatric Association [APA], 1994, p. 453). It is therefore possible that in some individuals, VCD is not a conversion reaction but rather part of a different psychological condition.

Psychological etiologies of VCD have also included depression, hysteria, childhood sexual abuse, personality disorders, adjustment disorders, and posttraumatic stress syndromes. Case (1991) stated that "although the larynx is a well-organized and stable biological structure with complex neurological control, its vulnerability to changes in the individual's emotional or psychological state makes it an excellent barometer of mental and psychological stability" (p. 187).

Kellman and Leopold (1982) suggested that VCD patients have a possible physiological predisposition to symptoms similar to those of panic attacks. Symptoms such as dyspnea and choking, identified as 2 of the somatic symptoms of panic attacks in the DSM-IV (APA, 1994), are similar to those experienced by VCD patients. Lacy and McManis (1994) stated that "the nature of the symptoms requires that consultants carefully consider panic and anxiety as possible causes" (p. 221). Although panic attacks have rarely been associated with VCD in the literature, there have been many studies correlating panic with asthma and other respiratory disorders (Baron, 1994; Bussing, Burket, & Kelleher, 1996; Carr, Lehrer, & Hochron, 1992; Karajgi, Rifkin, Doddi, & Kolli, 1990; Ley, 1989; Pollack et al., 1996; Porzelius, Vest, & Nochomovitz, 1991; Schmaling & Bell, 1997; Shavitt, Gentil, & Croce, 1993; Shavitt, Gentil, & Mandetta, 1992; Yellowlees, Haynes, Potts, & Ruffin, 1988).

The overlap between the symptomatologies of VCD, asthma, and panic attack episodes pose difficulties for health care professionals. Presented with an emergent and/or chronic symptom profile, the clinician must make accurate distinctions between these three conditions so that appropriate symptom management strategies may be employed. Unnecessary treatments such as intubation, tracheostomies, and long-term use of bronchodilators and steroids may therefore be avoided. Administering and prescribing appropriate psychotropic medications, and referrals for speech therapy and psychotherapy, may then be substituted for these aggressive and often harmful treatments.

Purpose of Study

The purpose of this study was to explore the symptom experiences of individuals in the following four diagnostic groups: (a) VCD only, (b) VCD and Asthma (c) VCD and Panic, and (d) VCD, Asthma, and Panic. The types of symptom episodes to be investigated included three "single diagnosis" symptom episodes (VCD episodes, Asthma episodes, and Panic episodes) and four "combined diagnosis" symptom episodes (VCD / Asthma, VCD / Panic, Asthma / Panic, and VCD / Asthma / Panic). The specific research questions addressed in the study were:

1. What is the symptom constellation, order of symptom presentation, and symptom severity experienced by patients during a typical/prototype "single diagnosis" symptom episode?

2. What is the symptom constellation, order of symptom presentation, and symptom severity experienced by patients during a typical/prototype "combined diagnosis" symptom episode?

3. What is the symptom constellation, order of symptom presentation, and symptom severity experienced by patients in each of these four diagnostic groups during what they consider to be their "worst" symptom episode?

4. What is the overlap of symptoms among the symptom episodes?

5. What are the experiences of these patients in terms of symptom interpretation and symptom management outcomes?

Significance of the Study

As the nursing profession continues to support advanced nursing practice, more nurses will be functioning as advanced practice nurses independent of medical supervision except in a consulting capacity. One role of the advanced psychiatric/mental health practice nurse is the assessment, diagnosis, and treatment of mental health problems in clients who present to community clinics. A better understanding of the symptom experiences of individuals with VCD and Asthma and/or Panic will assist advanced practice nurses to identify missed or inaccurate diagnoses that can lead to inappropriate, expensive, and often dangerous treatments such as intubations, tracheostomies, bronchodilators, and steroids. More appropriate, valuable, and beneficial treatments such as breathing retraining, relaxation therapy, cognitive therapy, and psychotherapy can be proposed and appropriate referrals made to speech language pathology. More importantly, however, a better understanding of the symptom experiences of patients with any combination of these conditions will help the patients themselves to adjust daily to living with and managing their symptoms, interpret their symptoms more accurately, and make more appropriate symptom management decisions.

CHAPTER 2

Literature Review

Symptom Experience

Giardino and Wolf (1993) defined symptoms as "subjective phenomena regarded as indicators of a condition departing from normal function, sensation, or appearance" (p. 20). Signs, in contrast, are subjective indicators of disease verified by physical findings and/or technology. When a diagnosis needs to be made in order for appropriate interventions to be implemented, the significance of reported symptoms and the physiological indicators of disease must both be skillfully evaluated by the clinician. In addition, patients' self-understanding and the influence of that self-understanding on their symptom reporting needs to be interpreted (Benner, 1989). Symptoms therefore serve as intervention foci for clinicians, and patients' subjective experiences of symptoms serve as barometers of successful interventions (Giardino & Wolf, 1993).

Symptom experience was defined by McDaniel and Rhodes (1997) as "a dynamic process that involves the perception, evaluation, and meaning of and the response to a symptom" (p. 233). When an individual experiences a symptom and internal change is noted, an assessment process is initiated during which the individual organizes, compares, judges, and acts on information about the change (Teel & Meek, 1997). This often involves comparisons between symptom episodes. In his book about his experiences as an asthmatic, Brookes (1994) described a severe attack of dyspnea significantly different from his other asthma attacks. The comparison between these attacks helped him to make decisions regarding what to do about the symptoms. How one perceives his or her symptoms therefore plays an important role in self-treatment or self-management of symptoms. As Gonder-Frederick and Cox (1991) state, "recognition and interpretation of physical symptoms influence behavior in nearly every illness experience, guiding self-diagnosis, medical help-seeking, health-care decision making, and self-treatment processes" (p. 220).

Leventhal (1997) developed a model of symptom processing which included the assumptions that every psychological event can be described at a biological level, and that symptom processing involves perceptual processes including innate anatomical and neurochemical mechanisms; memory codes or schemata of symptoms, emotional reactions, and environmental events; and highly abstract conceptual processing that generates meaning from reflections about experience. Because symptom management begins with assessment (Giardino & Wolf, 1993), and symptom experiences often vary greatly from the clinician's assessment of the symptoms and their severity (McDaniel & Rhodes, 1995), it is vital that the patient's symptom experience be evaluated including symptom management information about the occurrence, distress, and self-care strategies used (Giardino & Wolf, 1993).

There were no studies found in the literature relating to specific symptom experience evaluation. Nor were there any studies found relating to the symptom experience of VCD patients. However, Teel, Meek, McNamara, and Watson (1997) developed a model for understanding symptoms from the patient's perspective. Assumptions inherent in this model are that symptom experience is intrapersonal; that symptom interpretation or appraisal is multidimensional, involving cognitive identification and the use of knowledge structures and reasoning; and that the knowledge of a symptom and the attached meaning helps in the understanding of the outcome related to the symptom. Teel et al. agreed with Leventhal's (1986) claims that (a) symptoms are not subject to shared experience but have instead different and conflicting meanings for patients and clinicians, and (b) symptom meanings are endless.

The Symptom Interpretation Model (SIM) therefore focuses on symptom experience from an intrapersonal perspective, and suggests that "interpretation and ultimately, selection of outcome behaviors are clearly dependent upon the cognitive element and are not solely explained by the stimulus, a distinction critical to the understanding of individual response to symptoms and the management of symptoms" (Teel et al., 1997, p. 180).

The three constructs of the SIM are input (recognizing that something is different), interpretation (naming the sensation and attributing meaning), and outcome (decision-making regarding action or no action). Teel et al. (1997) suggest that familiarity with a symptom leads to the development of a typicality bias based on how the symptom is personally represented. The SIM includes patient interviews during which patients interpret their symptoms by examining past symptom experiences. This includes both exemplar (worst symptom experience) and prototype (typical symptom experience) descriptions of their symptoms. Comparisons are then made with current symptom experiences along with effectiveness of outcome strategies. As Teel et al. state, "to understand and make decisions about their symptom experience, patients often rely on previous knowledge rather than physical measures used by the traditional health care system" (p. 179).

When disruptive internal sensations are noticed and interpretations are made, individuals form their own personal diagnoses which influence their decision-making regarding outcomes. Current situations are understood through perspectives on past similar and dissimilar patterns. Patients can become experts in their own assessment of their symptoms and their self-care, and this must be acknowledged and respected by clinicians (Benner, 1989). Patients need to increase their ability to make diagnoses of their symptoms and identify patterns of changes in symptom presentations. How successful decision-making regarding outcome is depends on this knowledge (Lareau, 1997). When symptom episodes and possible outcomes are complicated by the existence of three separate but related disorders such as VCD, asthma, and panic, it may become very difficult for the individual to interpret internal sensations accurately in order to make appropriate decisions regarding outcomes.

Vocal Cord Dysfunction and Asthma

Vocal cord dysfunction (VCD) is a condition that causes upper airway obstruction as a result of vocal cord closure, most often during the inspiratory phase of breathing. Symptoms include wheezing, dyspnea, and sometimes stridor, which can be mistaken for asthma. It has been found to be more common in women between the ages of 20 and 40, with an increased incidence in healthcare workers. Symptoms do not respond to bronchodilators or steroids, yet these patients tend to be managed on high doses of these medications. Expiratory flows and arterial blood gases are found to be normal during acute attacks, but the inspiratory limb is flattened. If asymptomatic, the laryngoscopy will show normal vocal cord motion (Newman, 1993). Fiberoptic nasolaryngoscopy has made assessment of the airway during acute attacks simple, and abnormal adduction of the vocal cords can be seen on inspiration. VCD is therefore not factitious asthma or a malingering disorder (George, O'Connell, & Batch, 1990).

No organic etiology is associated with most cases of VCD, yet sometimes occurring respiratory distress can precipitate "unnecessary endotracheal intubation, cardiopulmonary resuscitation, or tracheostomy" (Gallivan, Hoffman, & Gallivan, 1996). Although many case studies in the literature have been documented well by Lacy and McManis (1994), VCD has not been mentioned in many recent vocal disorder texts. Yet, out of 164 medical records of patients who had had fiberoptic rhinolaryngoscopy surveyed by O'Connell, Sklarew, and Goodman (1995), 12% had VCD.

Paradoxical vocal cord motion can be difficult to diagnose because of its episodic nature. Although there is no organic etiology, it is not always benign and can induce significant hypoxemia (Hayes, Nolan, Brennan, & FitzGerald, 1993). It can therefore be found to mimic other airway diseases such as asthma. This misdiagnosis often results in unnecessary emergency treatment. Pitchenik (1991) presented case studies of patients with severe dyspnea and inspiratory stridor presenting to emergency units. Airway resistances were found to be normal, and panting was used as a diagnostic test for nonorganic acute upper airway obstruction (VCD). The panting maneuver was subsequently used to help prevent and abort future attacks, and the symptoms eventually subsided.

Although there may be at times a comorbidity between asthma and VCD, the symptoms of asthma are often out of proportion. Many case studies have described both patients who have been misdiagnosed with asthma and patients who have increased asthma symptomatology because of the comorbidity with VCD (Corren & Newman, 1992; Elshami & Tino, 1996; Freedman, Rosenberg, & Schmaling, 1991; Kellman & Leopold, 1982; Martin et al., 1987; Nahmias et al., 1994; Newman et al., 1995; Niven et al., 1992; Shao et al., 1995; Wanger & Beam, 1992).

Corren and Newman (1992) presented cases of 20 women who were referred for severe asthma that was not relieved by bronchodilators or steroids. When asymptomatic, their spirometry and arterial blood gases were normal. During acute attacks, however, there was a marked flattening of the inspiratory flow-volume loop. Laryngoscopy demonstrated adduction of the vocal cords on inspiration. The women were then referred to speech therapy, and their symptoms improved. In another more recent study by Murray and Lawler (1998), 23 females, all of whom had tracheal intubations with ventilatory support in the past for status asthmaticus, were assessed with fiberoptic laryngoscopies on their second emergency admission. The fiberoptic laryngoscopies showed adduction of the vocal cords during exhalation yielding a diagnosis of VCD. Consequently, it was determined that a less invasive approach to treating the symptoms was necessary.

Newman et al. (1995) did a retrospective study over seven years of 95 patients divided into three groups: patients with VCD but not asthma, patients with both VCD and asthma, and patients with asthma but not VCD. In the VCD-only group, 28% had been intubated in the past, and there was an average of 5.9 admissions to hospital per year. During a 4.8-year period, these patients had been maintained on the same medications as those patients with severe asthma only.

Freedman et al. (1991) described three cases of women with unmanageable asthma who had had extensive medical interventions. Further investigations revealed that they actually had paradoxical vocal cord motion. It is interesting to note that all three women had histories of childhood sexual abuse. Freedman et al. then went on to complete a retrospective chart review of 47 women with a diagnosis of VCD. A history of sexual abuse was found in 36% of these women, with 13% more having a family history indicative of the possibility of childhood sexual abuse.

Because there has been increasing awareness in the medical field of VCD mimicking asthma, diagnoses of VCD have led to other treatment options such as speech therapy and psychotherapy. Shao et al. (1995) described the case of a 13-year-old boy with a history of bronchial asthma that did not respond to bronchodilators or corticosteroids. After observing adduction of the vocal cords on inspiration during stridor, treatment was enhanced with panting exercises that relieved the symptoms. In three cases studied by Niven et al. (1992), steroid therapy was withdrawn, and both speech therapy and psychological support were implemented in women diagnosed with VCD after years of having what was thought of as treatment-resistant asthma. Elshami and Tino (1996) reported on three patients who were a subset of asthmatics who also had VCD, which contributed to their asthma symptoms. The need for psychological support and speech therapy for breathing retraining was emphasized in order to prevent unnecessary intubations and tracheostomies.

Although VCD has not been well-recognized in children in the past (Kayani & Shannon, 1998), there have been a number of recent studies focusing on VCD and this age group. Kayani and Shannon presented a case study of two adolescents who had been previously diagnosed with exercise-induced asthma. When VCD was identified, both patients were treated with speech therapy and remained symptom free for two years. The researchers concluded that VCD could be induced by exercise similar to exercise-induced asthma. Brugman and Simons (1998) stated that VCD occurring in adolescents can often mimic exercise-induced asthma with an unpredictable symptom pattern. The onset is abrupt, and asthma medications fail to resolve symptoms. Symptoms may include difficulty breathing in more than out, throat tightness, sensation of coughing, hoarseness, and numbness and tingling. The patients may be anxious and panicky, and tend to hyperventilate. Niggeman, Paul, Keitzer, and Wahn (1998) presented case studies on three adolescent patients ranging in age from 9 to 17. Each patient had been treated on a long-term basis for bronchial asthma which was aggravated by psychological stress, physical exercise, and hyperventilation. Laryngoscopies proved that all three patients had VCD. When antiasthmatic therapy was discontinued, no patient showed a deterioration, and speech therapy and psychological intervention were helpful.

The number of patients with vocal cord dysfunction presenting as asthma has been increasing. Although during symptoms the flow-volume loop may show abnormalities on inspiration, the definitive diagnostic test is the fiberoptic laryngoscopy to observe paradoxical motion of the vocal cords (Martin et al., 1987). Increased professional awareness of this symptomatology has given medical personnel more treatment options that help to avoid unnecessary aggressive emergency care. However, laryngoscopy is only useful during acute episodes of VCD when adduction of the vocal cords is visible during inspiration. Patients and health care professionals could benefit from an increased understanding into how the symptoms of VCD and asthma overlap each other, and how the symptom experiences differ.

Panic and Asthma

The concept of panic is rooted in myth involving the Greek God Pan, who would let out a blood-curdling scream when awakened by travelers on a country road and scared many a traveler literally to death. The APA's (1994) Diagnostic and Statistical Manual of Mental Disorders (4th ed.) defined a panic attack as "a discrete period of intense fear or discomfort that is accompanied by at least 4 of 13 somatic or cognitive symptoms" (p. 394). The attack develops suddenly and peaks within 10 minutes, with the individual often experiencing a sense of impending doom. Symptoms experienced include 4 or more of the following: palpitations, pounding heart, accelerated heart rate, dyspnea, chest pain, choking or smothering sensations, sweating, shaking, nausea, abdominal distress, dizziness, derealization or depersonalization, fear of losing control, fear of dying, numbness or tingling sensations, and chills or hot flashes (APA, 1994).

Although the neurobiology of panic has been addressed in the literature (Klein, 1993; McNally, Hornig, & Donnell, 1995; Papp, Klein, Martinez, & Schneier, 1990), it still remains in the preliminary state of knowledge. Barlow (1988) believed that panic differs from generalized anxiety because it is short lived and intense. He reported an intriguing finding that persons with generalized anxiety experienced vasoconstriction of the fingertips, and persons with panic, vasodilation. One of the most documented neurobiological theories is Klein's (1993) suffocation false alarm theory. This theory suggests that persons who experience panic attacks have a physiological hypersensitivity to carbon dioxide, which produces sensations of suffocation that result in hyperventilation and panic. McNally et al. (1995) tested this theory using 37 subjects with clinical panic attacks and 66 subjects with nonclinical panic attacks differentiated with a diagnosis of panic disorder. They found that of all the physiological symptoms of panic, suffocation sensations had the largest effect (r=0.42). However, they also found that it was the cognitive symptoms such as fear that best discriminated between clinical and nonclinical panic attacks.

Salkovskis (1988) also stated that panic attacks differ qualitatively from severe anxiety. He identified the three cognitive factors in panic as being catastrophic cognitions, which are bodily sensations such as palpitation, breathlessness, and dizziness interpreted in frightening ways; imagery; and loss of appraisal capacity. Salkovskis disagreed with the idea that panic is synonymous with severe anxiety. Beck (1996) also felt that panic needs to be viewed separately from anxiety because of the autonomic symptoms and catastrophic cognitions. Ley (1992) found that "while catastrophic cognitions and hyperventilation rank high among the symptoms of the DSM-III-R classification of panic attacks, they are not a necessary component of panic" (p. 347). Ley divided panic attacks into three categories or types as follows:

1) The classic or Type I panic attack which is characterized by "uncontrolled, high intensity dyspnea (sense of impending suffocation) and heart palpitations

accompanied by terror (extreme dyspneic-fear) together with a strong desire to flee" (p. 349).

2) The anticipatory or Type II panic attack which is characterized by "fearful concern on what might happen rather than what is happening" (p. 350). Symptoms include mild dyspnea, mild palpitations, weakness, fear of losing control, and dread of what might follow.

3) The cognitive or Type III panic attack which includes "a relatively mild state of apprehension associated with timidity and lack of assertiveness, in which the terror and strong desire to flee that marks the Type I attack and the anticipatory anxiety that marks the Type II attack are missing" (p. 354).

Besides neurobiological and cognitive factors in the etiology of panic attacks, there are also psychodynamic factors. Barlow (1988) suggested that there is a relationship between separation anxiety in children and panic attacks. In a review of studies on separation anxiety and panic, Barlow found that the connection between separation anxiety and panic is not convincing, but that there is enough evidence to suggest a possible relationship.

Not all individuals who have panic attacks experience the same combination of symptoms, and often symptoms in one individual will vary with each attack. Differences are therefore common both "between" individuals and "within" individuals in panic attack symptomatology. An example of "between" individual differences is given in Barlow and Cerny's (1988) study where symptoms experienced by 96 persons with panic disorder were examined. The subjects were divided into two groups, the first group (n=41) being diagnosed according to DSM-III criteria and the second group (n=55) according to DSM-III-R criteria. The findings included the experience during panic attacks of dyspnea in 90% of the group 1 subjects and 73% of group 2 subjects;

and choking in 41% and 50% of the subjects respectively. The "within" individual differences as described by Barlow and Cerny include (a) full-blown panic attacks versus limited symptom panic attacks; (b) a slightly different mix or intensity of symptoms from one panic attack to another, (c) nocturnal versus wakeful panic attacks; and (d) cued panic attacks versus spontaneous panic attacks.

There has been a great deal of evidence in the literature to suggest a symptom overlap between panic attacks and respiratory illness (Smoller, Pollack, Otto, Rosenbaum, & Kradin, 1996). Examples of this overlap include the dyspnea and choking experienced in panic overlapping with the shortness of breath and wheezing experienced in asthma. It has been found that the most common psychiatric disorders diagnosed in asthmatic patients are anxiety disorders, including panic (Yellowlees et al., 1988). Yellowlees et al. studied 36 asthmatic patients using the Diagnostic Interview Schedule and the criteria listed in the DSM-III-R and found that out of the 33% prevalence rate of psychopathology, 87% had anxiety disorders. According to the DSM-IV (APA, 1994), panic attacks occur in many of the anxiety disorders, including panic disorder, social phobia, specific phobias, and posttraumatic stress disorder. Schmaling and Bell (1997) cited statistics indicating that panic disorder is particularly common in asthmatic patients in 6% to 24% of samples, whereas the general population lifetime prevalence is 2% to 5%. In a literature review on asthma and emotion, Lehrer, Isenberg, and Hochron (1993) found that emotion can precipitate asthma in some individuals by affecting autonomic mechanisms for bronchoconstriction through the vagus nerve. They also found that the relationship between asthma and emotion moved in the opposite direction as well in that asthma can precipitate increased negative emotions leading to hyperventilation and panic. "Asthmatics experiencing high panic-fear will recount more fearsome encounters with severe asthma attacks than other asthmatics" (p. 16).

Yellowlees and Kalucy (1990) presented a model of dynamic interaction of medical and psychosocial issues in asthma to explain outcome. They found that "there are a variety of biologic, psychologic, and social factors that suggest that the disorder of asthma may in itself be anxiogenic and that simply having asthma may give patients an increased vulnerability toward the development of anxiety disorders" (p. 628). Because of the psychosocial implications of asthma, such as stress, maternal overprotectiveness, maternal rejection of the asthmatic child's neediness, and peer ostracy, it is known that there is a tendency for asthmatic patients to experience psychological problems (Alt, 1992; Bussing et al., 1996). It makes sense that because breathing is so important to life, the threat of breathlessness would lead to panic. Bussing et al. used DSM-III-R anxiety disorder criteria to compare 31 healthy, normal children with 37 asthmatic children and found that the asthmatic group had more anxiety disorders, school problems, intrafamilial stress, and family histories of emotional problems. Panic symptoms were also higher in the asthmatic group ($p<0.08$) and were unrelated to asthma attacks. The authors acknowledged that there were selection effects related to this study and that the sample size was small.

The multifactorial association between panic and asthma has led to a number of studies done to separate and understand the quality and direction of the relationship. Carr, Lehrer, Hochron, and Jackson (1996) used a sample of 61 individuals with asthma only, 10 with asthma and panic disorder, 24 with panic disorder only, and 18 with neither condition to assess differences in airway impedance levels using a quasi-experimental design that utilized tasks to increase arousal states. The results suggest that "the airways of individuals with panic disorder are in a chronic state of preparedness, which may promote hyperventilation" (p. 137). Shavitt et al. (1992) looked at point prevalence of phobic anxiety disorders in 107 asthmatic patients using questionnaires, structured psychiatric interviews, and diagnostic criteria according to the DSM-III-R. They found that clinicians often mistake panic attacks for crises of asthma. The point prevalence of anxiety disorders was 6.5%. Shavitt et al. (1993) then went on to look at the failure of medical personnel to recognize panic disorder in asthmatic patients. A case report of a 32-year-old woman demonstrated that panic attacks were mistaken for asthma, leading to overuse of inhalants. When panic disorder was finally diagnosed, the patient was started on clomipramine with good results in decreasing emergency visits. Baron (1994) used a clinical case study to begin to answer the question as to whether or not treating panic will also change the course of asthma. He treated over 20 prediagnosed asthma patients with anxiolytics and cognitive therapy, and all of the patients demonstrated a decrease in both their asthma symptoms and their medication intake.

The results of a study by Van Peski-Oosterbaan, Spinhoven Van der Does, Willens, and Sterk (1996) conflict with those of the previously mentioned studies. They assessed the prevalence of panic disorder using the Anxiety Disorders Interview Schedule-Revised, the Agoraphobic Cognition Questionnaire, the Body Sensations Questionnaire, the Panic Attack Questionnaire, and the State-Trait Anxiety Inventory in 78 asthmatics and 45 nonasthmatics and evaluated the differences in their symptom perceptions by inducing bronchoconstriction with a histamine challenge. The point prevalence of panic disorder was 9.0% in the asthmatic group and 8.9% in the nonasthmatic group. The patients with panic disorder had higher levels of perceived breathlessness. The researchers concluded that "it seems unwarranted to interpret the relatively high prevalence of panic disorder in asthmatic patients as specific for asthma" (p. 339).

Schmaling and Bell (1997) contended that anxiety disorders can have an impact on the symptom response of asthmatic patients. Asthma attacks and panic attacks have been confused with one another, resulting in inaccurate diagnoses and unnecessary treatments. Panic can also have an impact on asthma management in true asthmatics, and this could result in overestimation of the asthma condition. Panic may be misconstrued as the patient's respiratory disorder worsening, and asthma attacks associated with fear leading to panic and anxiety symptoms may contribute to the onset of asthmatic attacks (Schmaling & Bell, 1997; Shavitt et al., 1993; Shavitt et al., 1992). It is therefore important for professionals to be aware of the comorbidity of asthma and panic and the interaction of medical and psychosocial factors.

Some studies in the literature have also looked at the relationship between panic and other respiratory conditions. Karajgi et al. (1990) found that 16% of 50 outpatients with stable chronic obstructive pulmonary disease (COPD) had an anxiety disorder and that 8% had a diagnosis of panic disorder according to DSM-III-R criteria. They discovered that the lifetime prevalence of panic disorder in these COPD patients was 5.3 times higher than in the general population. Zandbergen et al. (1991) assessed 90 patients, 30 each with panic disorder, obsessive-compulsive disorder (OCD), and eating disorders. The lifetime prevalence of respiratory disorders was 47% in the panic disorder group compared to 13% in both the OCD and the eating disorders groups. The respiratory disorders included asthma, bronchitis, allergy, and pneumonia. Spinhoven, Rus, Westgeest, and Van der Does (1993) also found a higher lifetime prevalence of respiratory disorders in patients with panic disorder, using a large sample size of 100 panic disorder patients, 100 patients with major depressive disorder, and 100 V-code patients.

Dales, Spitzer, Schechter, and Suissa (1989) used the American Thoracic Society Respiratory Symptom Questionnaire (ATS-Q) and the Psychiatric Symptom Index (PSI) to study 600 healthy subjects with no diagnosed respiratory disease. They found consistent associations between PSI subscales and respiratory symptoms such as cough, wheeze, and dyspnea. For every 10% increase in the anxiety score, there was a 1.64 relative increase in the odds of reporting cough. Finally, Pollack et al. (1996) studied the prevalence of panic attacks and panic disorder in 115 patients referred for pulmonary function testing. Of these patients, 41% reported panic attacks, and 17% (N=41) were diagnosed with panic disorder using the Structured Clinical Interview for DSM-III-R (SCID). The authors concluded that "panic disorder and subsydromal panic are relatively common and may be unrecognized and inadequately treated in patients who present with respiratory symptoms" (p. 110). Finally,

The symptom overlap and interplay between panic attacks and respiratory disease, particularly asthma, and between asthma and VCD is well documented. However, a gap exists in the literature when examining the symptom overlap and interplay between panic and VCD. Actually, such symptoms as choking, dyspnea, and fear of dying are seen in all three conditions. The next section will examine what has been addressed in the literature regarding VCD and various psychiatric disorders including panic symptomatology. For the purposes of this study, the term panic will be used synonymously with panic attack.

Psychiatric Aspects of VCD

Many years ago, Moses (1954) observed that "all the symptoms of neurotic anxiety involve the vocal mechanism" (p. 105). More recently, Brugman and Simon

(1998) stated that "the larynx is the end-organ for stress" (p. 74). Emotions can be seen as involuntary factors affecting breathing, which is why during lie detector tests respiratory changes and blood pressure deviations are registered when there is an emotional reaction. Ramirez et al. (1986) and Brugman and Simon (1998) identified functional stridor as a symptom of psychiatric disease or psychosocial distress, and Martin et al. (1987) stated that the "paradoxical vocal cord syndrome is best conceptualized as a variation of a conversion disorder, often in the absence of other psychopathology" (p. 333). Martin et al. described VCD as an unconscious symptom of women who experience difficulty separating themselves from childlike family relationships. Because the symptom is not under conscious control, the dysfunction cannot be seen as malingering or fictitious. Christopher et al. (1983) were the first to suggest that VCD is a conversion disorder. They stated that "abnormal laryngeal function may be learned and may be an unconscious somatic expression of dysphoric feelings, with features characteristic of a conversion disorder" (p. 1569).

Newman (1993), however, suggested that although there is an increased incidence of psychopathology in VCD patients, there is "no uniformity to the psychiatric diagnosis" (p. 4). Many case studies have demonstrated various types of psychopathology in VCD patients, including major depression, obsessive-compulsive disorder, dependent personality disorder, conversion reaction, and posttraumatic stress disorder (Barnes et al., 1986; Brown, Merritt, & Evans, 1988; Geist & Tallett, 1990; Liistro, Stanescu & Dejonckene, 1990; Meltzer et al., 1991; Mobeireek, Alhamad, Al-Subaei, & Alzeer, 1995; Newman et al., 1995; Ophir, Katz, Tavosi, & Aladjew, 1990; Skinner & Bradley, 1989). All of these case studies supported the idea that VCD is psychogenic.

Geist and Tallett (1990) diagnosed a 16-year-old girl with a history of asthma with conversion disorder according to the DSM-III-R after observing VCD. They described the conversion disorder as a symbolic crying of one who could not cry. An episode of crying three weeks after VCD diagnosis decreased her anxiety and sadness, and the stridor disappeared. Liistro, Stanescu, Dejonckene, Rodenstein, and Veriter (1990) described a young girl with exercise-induced asthma diagnosed with VCD. They assessed somatization of conflict in the family as being part of her symptomatology. When the parents informed their daughter of this diagnosis, her symptoms disappeared, and she remained asymptomatic for eight months.

Mobeireek et al. (1995) described three Saudi females under social stress relating to polygamy. Each woman had previous hospitalizations for asthma attacks and were subsequently diagnosed with VCD. They were treated with psychotropic medications after discontinuing bronchodilators and steroids, and they were also referred for speech therapy and psychological support. Pulmonary symptoms improved in all three patients. Ophir et al. (1990) stated that the symptoms of all three of their adolescent patients diagnosed with VCD were inducted by emotional stress. The "laryngeal spasm was an unconscious somatic expression of an emotional conflict" (p. 1209).

In 1994, Lacy and McManis reviewed 48 cases of psychogenic stridor (VCD) presented in the medical literature. Conversion disorder was diagnosed in 52% of the patients, even though Newman and Dubesler (1994) stated that there is "little evidence to support the diagnosis of conversion disorder in VCD patients" (p.142). The male-female ratio was 23%:77%. Although the treatments recommended included benzodiazepines, panic was never referred to, and anxiety was mentioned in only one case. George et al. (1990), although noting emotional problems in all of the cases reported in the literature from 1974 to 1989, stated that the "efficacy of psychiatric treatment in prevention of further episodes of stridor is unknown at present" (p. 314).

Newman et al.'s (1995) retrospective seven-year study of 95 patients, which was previously mentioned, demonstrated that 73% of the VCD-only group had a DSM-III-R Axis I diagnosis, and 38% had a history of abuse. Tajchman and Gitterman (1996) also associated VCD with abuse when they studied a 14-year-old girl with a history of wheezing, dyspnea, and tachypnea. She disclosed an incident of sexual abuse at age 8, and her symptoms fit the criteria for posttraumatic stress disorder. Kuppersmith, Rosen, and Wiatrak (1993) described a 14-year-old girl with VCD. Psychosocial stressors in her life included an ongoing parental court battle for custody. She was eventually treated successfully with panting exercises and ongoing counselling. Kuppersmith et al. stated that "identification of psychosocial stressors and psychiatric intervention, in the form of psychotherapy, resulted in the cure of our first patient, and was used in 29% of patients described in the literature" (p. 169).

Anxiety and panic have been addressed minimally in the literature in relation to VCD. Selner, Staudenmayer, Koepke, Harvey, and Christopher (1986) described VCD as internalization or "choking off" of anger, which has been shown clinically to be related to panic attacks. Ramirez et al. (1986) stated that "some investigators believe that episodic laryngeal wheezing may be triggered by high levels of anxiety" (p. 57). Fields, Roy, and Ossorio (1992) studied 29 women who had episodic dyspnea accompanied by tachycardia and light-headedness. All had adduction of the vocal cords on both inspiration and expiration. Anxiety was alleviated with midazolam hydrochloride, and the symptoms of VCD subsequently ceased. Sim, McLear, Lee, Naranjo, and Grant (1990) reported a case of a 30-year-old female nurse with dyspnea, coughing, dysphonia, constriction of her throat, and severe choking episodes. She had been in intensive care four times in one year. A fiberoptic laryngoscopy showed paradoxical vocal cord motion, and a psychiatric evaluation was recommended. It was hypothesized that high levels of anxiety triggered the VCD, and after being treated for anxiety with biofeedback, the symptoms ceased.

Gavin, Wamboldt, Brugman, Roesler, and Wamboldt (1998) used a prospective, case-control methodology to study family and individual functioning in pediatric VCD patients. Each of the 12 VCD patients was matched to another with asthma and no VCD. The basis of matching was gender, race, and admission prednisone dosages. After administering a number of valid and reliable psychological measures, it was found that the patients with VCD had significantly higher numbers of anxiety symptoms ($t=-3.32$, *p* less than 0.01 two tailed). Several of the VCD patients met the criteria for separation anxiety which has been thought to precede panic disorder in adulthood. The researchers also found that the "anxiety symptoms preceded the onset of respiratory symptoms in the majority of the patients with VCD, and the anxiety followed respiratory symptoms in the patients with asthma alone" (p. 415). This is the only study in the literature that identifies the possibility that VCD may be a precursor or variant of panic disorder given the phenomenological overlap of these disorders.

When panic is compared with VCD, it is clear that there is an overlap in symptomatology, etiology, and treatment strategies. Etiological similarities include separation anxiety and internalization of conflict. Treatment strategies such as breathing retraining, relaxation, cognitive therapy, anxiolytic and antidepressant medication, and psychological support have been successful with both panic and VCD. It is also known that "physical symptoms of panic attacks overlap with those of many medical illnesses" (Smoller et al., 1996, p. 10). Smoller et al. stated that "the relation of vocal cord dysfunction (VCD), if any, to panic disorder has not been defined" (p. 10). It seems, therefore, that studies examining this relationship would be useful. However, a more in depth understanding into the symptom overlap and interplay between VCD and panic is needed first. Because patients with VCD have often also been diagnosed with asthma, and asthma and VCD have definite symptom similarities that have been previously studied, patients demonstrating two or all three of these symptom profiles need to be accessed. In addition, symptom interpretation and the effects of this interpretation on decision-making and outcome need to be studied along with the symptoms themselves in order to understand how both the clinician and the individual experiencing the symptoms can choose the most appropriate interventions. The perception, interpretation, and response to symptoms was defined previously as symptom experience (McDaniel and Rhodes, 1997).

Definition of Term

Symptom Experience: An individual's perception, evaluation, meaning of, and response to a symptom episode, as measured by an interview and card sort focusing on symptom type, severity, and quality; how the symptom episode was interpreted; and the resultant outcome.

CHAPTER 3

Method

Research Design

This descriptive study was designed to explore the symptom episodes experienced by VCD patients with or without Asthma and/or Panic. It utilized a structured clinical interview based on a multiple card sort procedure to identify the constellation, order of presentation, and severity of symptoms experienced by the patient during (a) "single diagnosis" typical symptom episodes [VCD, Asthma, and Panic]; (b) "combined diagnosis" typical symptom episodes [VCD / Asthma, VCD / Panic, Asthma / Panic, and VCD / Asthma / Panic]; and (c) the worst symptom episode the patient had ever experienced. The multiple card sort was followed by a semi-structured clinical interview designed to explore the patient's interpretations and outcomes of these symptom episodes.

Sample

The population consisted of persons 15 years of age and older who had been diagnosed with psychogenic VCD and who lived in the Province of Alberta. Because of the limited number of persons with VCD, a nonprobability convenience sample, including both genders, was utilized. The inclusion criteria were: (a) males and females 15 years of age and older, (b) ability to understand written and spoken English, (c) absence of severe psychopathology, and (d) a confirmed diagnosis of VCD .

Screening and Selection. Potential subjects were initially screened by VCD clinic coordinators (speech pathologists) for the diagnosis of psychogenic VCD made previously by an ear, nose and throat specialist, and the diagnosis of Asthma made previously by a pulmonary specialist. The VCD diagnosis was based on either a definitive diagnosis made from a fiberoptic laryngoscopy, or Blager's (1994) clinical presentations of VCD in the absence of a definitive diagnosis. Adduction of the vocal cords on inspiration is not often seen unless patients present to the clinic in acute episodes. Blager's clinical presentations include a twitching larynx, symptoms being experienced upon exertion, random symptoms, symptoms being caused from inhaled irritants, upper chest tightness without lower airway disease, and symptoms that are described but are unable to be provoked under controlled conditions. The diagnosis of Asthma was based on the Canadian Consensus Guidelines (Ernst, FitzGerald, & Spier, 1996).

Subject Recruitment. Subjects were recruited over a period of four months from September, 1998 to December, 1998. Three centers were targeted for subject recruitment: (a) the Vocal Cord Dysfunction Clinic at the Glenrose Rehabilitation Hospital, Edmonton; (b) the Voice Clinic at the Rockyview Hospital, Calgary; and (c) the Speech Language Pathology department at the Alberta Children's Hospital, Calgary. It was expected that the sample size would be at least 20. One subject was recruited through a previous research study, the "Asthma-Anxiety Project" (Ross & Davis, 1997).

During a scheduled visit to one of the three centers, patients who met the inclusion criteria were approached by the clinic coordinator to determine if they would be willing to be accessed by the researcher. Patients who were still registered with a clinic but were not attending clinic regularly were contacted by the clinic coordinator by phone regarding access. If the patient was an adolescent, a letter (see Appendix A) was sent home with them for parental perusal, and the parents had access by phone to the researcher if their teen was interested. Patients who gave permission to be accessed were phoned by the researcher, and the study was explained. If the patient agreed to participate, an appointment was then scheduled for informed consent (see Appendices B, C, D, E, F, and G) and the clinical interview. The appointment settings were the respective clinic in three cases, the home in one case, and the workplace in two cases.

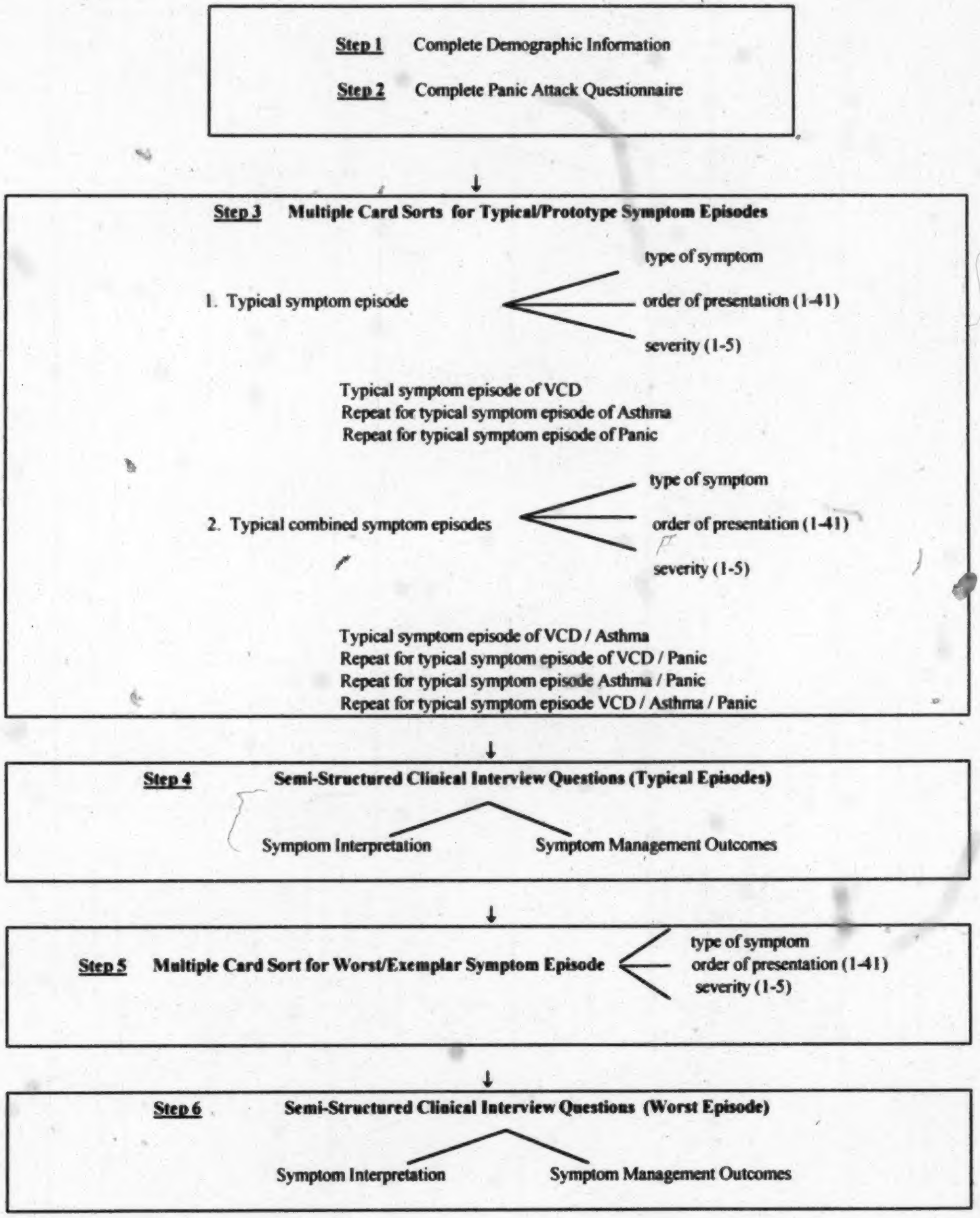
Research Protocol

The clinical interview commenced following the receipt of informed written consent (see Appendices B, C, F, and G) and after the Information Sheet (see Appendices B, C, D, and E) was discussed with the subject. Each interview was 1 - 2 hours in length depending on the subject's diagnostic group: (a) VCD; (b) VCD and Asthma; (c) VCD and Panic; and (d) VCD, Asthma, and Panic. As summarized in Figure 1, there were five steps in the clinical interview process.

Step 1: Complete Demographic Information. Demographic data was obtained by the researcher using the Demographic Data Form (see Appendix H) which included age, gender, marital status, occupation, brief medical and psychiatric history, other current medical illnesses, and current medications.

Step 2: Complete Panic Attack Questionnaire. After the researcher collected the demographic data, the subject was asked to complete the Panic Attack Questionnaire (PAQ) (Norton, Dorward, & Cox, 1986). The PAQ (see Appendix I) is a self-report questionnaire which provides a brief description of a panic attack and then asks respondents to answer a series of questions if they have "experienced one or more panic attacks in the past year". Widely used with nonclinical populations, the PAQ is designed to elicit information about: (a) the frequency and symptom profile of panic attacks experienced by the respondent; (b) the effects of panic on the patient's life; and

Figure 1. Summary of Research Protocol.


Step 1 Complete Demographic Information
Step 2 Complete Panic Attack Questionnaire
Step 3 Multiple Card Sorts for Typical/Prototype Symptom Episodes
1. Typical symptom episode
type of symptom
order of presentation (1-41)
severity (1-5)
Typical symptom episode of VCD
Repeat for typical symptom episode of Asthma
Repeat for typical symptom episode of Panic
2. Typical combined symptom episodes
type of symptom
order of presentation (1-41)
severity (1-5)
Typical symptom episode of VCD / Asthma
Repeat for typical symptom episode of VCD / Panic
Repeat for typical symptom episode Asthma / Panic
Repeat for typical symptom episode VCD / Asthma / Panic
Step 4 Semi-Structured Clinical Interview Questions (Typical Episodes)
Symptom Interpretation
Symptom Management Outcomes
Step 5 Multiple Card Sort for Worst/Exemplar Symptom Episode
type of symptom
order of presentation (1-41)
severity (1-5)
Step 6 Semi-Structured Clinical Interview Questions (Worst Episode)
Symptom Interpretation
Symptom Management Outcomes

(c) information about first-degree relatives who have experienced panic attacks.

For the purposes of this study, questions 2-7 from the updated and expanded DSM-IV version of the PAQ (Cox, Norton, & Swinson, 1992) was used to determine whether or not the subject suffered from panic attacks. Question 1 was not used because it includes demographic information that was obtained in Step 1 using the Demographic Data Form (see Appendix H). Questions 2-7 elicit information about the frequency and symptom profile of panic attacks experienced by the respondent during the past year. The PAQ is a revised version of the Anxiety Questionnaire (Norton et al., 1986). In a study completed by Harrison (1985), 22 out of 24 persons responding positively to the PAQ met the DSM-III diagnostic criteria for panic attack.

Step 3: Multiple Card Sorts for Typical/Prototype Symptom Episodes. The next phase of the interview was structured and consisted of multiple card sorts for typical/prototype symptom episodes. The multiple card sort technique helps to structure an interview without constraint and provides for more intensive interaction between subject and researcher (Canter, Brown, & Groat, 1985). There are a number of studies in the literature that have used multiple card sorts in different ways (Bilodeau and Degner, 1996; Burnard & Morrison, 1994; Canter, Brown, & Groat, 1985; Crow & Spicer, 1995; Degner & Sloan, 1992; Morrison & Bauer, 1993).

The card sort is described in the literature as a flexible technique that can be modified to allow for the provision of data that is hard to define using an unstructured interview format (Shelley, 1994). Another advantage of providing this type of structured interview is that it allows the subject to dictate the importance of variables. "In so doing, it allows the researcher to gather rich details about the informant's views of the world which may be analyzed both qualitatively and quantitatively" (Burnard &

Morrison, 1994, p. 106). Subjects are therefore able to formulate their own experiences in their own way.

The multiple card sorts in this study were used to examine symptom constellation, order of symptom presentation, and symptom severity in symptom episodes. Subjects were asked to look at symptom cards which included but did not differentiate all the known symptoms of VCD, asthma, and panic based on (a) Blager's (1994) clinical presentations and Newman, Mason, and Schmaling's (1995) clinical features of VCD; (b) the Asthma Symptom Checklist (ASC) developed by Kinsman, Luparello, O'Banion, and Spector, S. (1973a) and later modified by Brooks (1994); and (c) the American Psychiatric Association Diagnostic and Statistical Manual of Mental Disorders IV (1994) description of panic attacks (see Appendix J).

The symptoms of VCD (11), Asthma (36), and Panic (13) identified in the above literature were both combined and differentiated into 10 VCD symptoms, 23 Asthma symptoms, and 23 Panic symptoms (see Appendix K) to better define the symptoms for the subjects. The following summarizes this reduction process:

1. The Asthma symptoms of "irritable", "cranky", short-tempered", "edgy", and "frustrated with things" were combined into the symptom of "feeling irritable or cranky".

2. The Asthma symptoms of "chest congestion", "chest filling up", and "mucous congestion" were combined into the symptom of "congestion".

3. The Asthma symptoms of "fatigued" and "worn out" were included in the symptoms of "tired", "weak or no energy", and "exhausted".

4. The Asthma symptoms of "frightened", "nervous", "worried", "worried about having an attack", "panicky" , and "uncomfortable" were included in the

symptoms of "fear of being left alone", "fear of choking", "scared", and "fear of dying".

5. The VCD symptoms of "wheezing", "stridor on inspiration", and "stridor on expiration" were combined into symptoms of "wheezing breathing in" and "wheezing breathing out".

6. The Asthma symptom of "wheezing" was included in the symptom of "wheezing breathing out".

7. The Panic symptom of "chest pain or discomfort", the Asthma symptom of "chest tightening", and the VCD symptom of "upper chest tightness" were combined into "chest pain", "tightness in upper chest", and "tightness in lower chest".

It is important to note that a number of symptoms occur in two or more disorders (VCD, Asthma, and/or Panic). These symptoms are identified in Table 1 and are referred to as "common" symptoms. The 10 VCD symptoms, 23 Asthma symptoms, and 23 Panic symptoms were therefore combined into 41 symptom cards which include the "common symptoms" and the symptoms unique to each disorder (see Appendix K). For the purposes of this study, the symptoms are classified as (a) "unique" (applicable to one specific disorder), (b) "common" (applicable to two or more disorders), and (c) "overlap" (unique symptom of one disorder that is experienced during a symptom episode of another disorder but is not a common symptom).

Based on the importance in the Symptom Interpretation Model (Teel et al., 1997) of identifying both the typical/prototype and the worst/exemplar symptom episodes, the card sort began with the typical/prototype "single diagnosis" symptom episode of VCD. The subject was asked to choose the symptom cards that best described his/her typical symptom episode, and then to rank the symptoms according to their order of presentation. The subject was then asked to give a severity rating between 1 and 5 (1 being the lowest in severity) for each symptom.

If the subject had comorbid Asthma and/or Panic, he/she was then asked to repeat the above procedure for each type of symptom episode. If the subject had VCD and Asthma, the procedure was repeated for Asthma. If the subject had VCD and Panic, the procedure was repeated for Panic. Subjects who had VCD, Asthma, and

Table 1

VCD, Asthma, and/or Panic Symptoms in the Literature that are Common

Symptom	VCD	Asthma	Panic
wheezing breathing out	X	X	
tightness in upper chest	X	X	X
tightness in lower chest		X	X
actual choking	X		X
intestinal cramps		X	X
dizziness, unsteady		X	X
tingling or pins and needles		X	X
chest pain		X	X
shortness of breath	X	X	X
numbness		X	X
fear of dying		X	X
scared		X	X
stomach cramps		X	X

Note. X indicates the symptom is identified in the literature as part of the disorder.

Panic had the procedure repeated for both Asthma and Panic. Once these symptom episodes were completed, the procedure was repeated for the following "combined diagnosis" symptom episodes if they had occurred: (a) VCD/Asthma, (b) VCD/Panic, (c) Asthma/Panic, and (d) VCD/Asthma/Panic.

Step 4: Semi-structured Clinical Interview Questions (Typical Episodes). Once these multiple card sorts were completed and recorded, the researcher then began the semi-structured clinical interview process to address symptom interpretation and symptom management outcomes. The following are examples of some of the open-ended questions asked:

1. How do you typically interpret symptom episodes in general?
2. How do you differentiate VCD, Asthma, and/or Panic?
3. What is the most frightening symptom for you?
4. What are your experiences with health care professionals in relation to these symptom episodes?
5. What symptom management strategies work for you?

Step 5: Multiple Card Sort for Worst/Exemplar Symptom Episode. After the multiple card sort and semi-structured clinical interview were completed for the typical/ prototype symptom episodes, the subject was then asked to choose the worst/exemplar symptom episode he/she had ever experienced regardless of the type of symptom episode. The subject was instructed to choose the symptom cards that best described his/her worst symptom episode, and to rank the symptoms according to their order of presentation. The subject was then asked to give a severity rating between 1 and 5 (1 being the lowest in severity) for each symptom. The worst/exemplar symptom episode was left until the end of the structured interview because of the possibility that recalling the worst symptom episode could evoke emotional distress. The researcher was in a better position to assist the subject through potential emotional distress after developing rapport. The subject also had time to fully understand the procedure.

Step 6: Semi-structured Clinical Interview Questions (Worst Episode). The clinical interview concluded with the following open-ended questions addressing symptom interpretation and symptom management outcomes:

1. How was this worst symptom episode interpreted by you and/or any of the health care professionals involved?

2. What symptom management strategies did you and/or any of the health care professionals involved use?

3. What treatment interventions did you receive for this episode?

4. What was the outcome?

The semi-structured questioning portions of the interviews were audiotaped and transcribed after completion, and the multiple card sorts were recorded by the researcher during the interview.

Validity Issues

Order effect of card sorts for symptom episodes was controlled by counterbalancing the data. The order of the sort process was changed for each subject. For example, when a subject had VCD and Asthma, the order of card sorts for the typical symptom episodes were VCD and Asthma, but the next subject with VCD and Asthma had an order of card sorts starting with the symptom episode of Asthma followed by VCD.

Data Analysis

This was an exploratory study that recruited subjects from a rare population over a four month time frame. It was therefore impossible to use strong quantitative analysis, but given the exploratory nature of the study, it was also not necessary. Data analysis therefore concentrated on descriptive statistics such as the mean number of symptoms and frequency data of the occurrence of symptoms in each symptom episode; and the mean rank order and mean severity ratings for each individual symptom in all symptom episodes. Symptom episodes were then compared according to mean number of symptoms; frequency of symptoms; and mean rank order and severity of symptoms. Symptom overlap was also identified. Transcriptions of the semi-structured portion of the clinical interview were reviewed by the researcher, and information about the interpretation of symptom episodes and the experiences of the subjects in terms of symptom management outcomes was identified and extracted.

Ethical Considerations

This study was conducted following ethical approval from the Health Research Ethics Administration Board, which is a joint committee of the University of Alberta Health Sciences Faculties, the Capital Health Authority, and the Caritas Health Group. Because the Rockyview Hospital and the Alberta Children's Hospital in Calgary were research sites, the study was also approved by the Conjoint Medical Ethics Committee at the Foothill's Hospital.

Several steps were taken to protect the rights of the subjects who agreed to participate in the study. Firstly, access permission was obtained by a health care professional involved with the patient before the researcher made telephone contact. In the case of an adolescent patient, an information letter (see Appendix A) was given to the potential subject by the Clinic Coordinator to take home for parental perusal. Parents were asked to contact the researcher if they consented to their child's participation provided their child was in agreement. Secondly, during informed consent procedure, subjects were informed of the study's purpose, the voluntary nature of their involvement, and their right to refuse to participate (see Appendices B, C, F, and G). The subjects were also informed during the interview that they could refrain from answering any question, both written and/or oral, and could terminate the assessment at any time. Written, informed consent was obtained only after the above information had been shared with the subjects (see Appendices B, C, D, and E). Thirdly, subject anonymity and confidentiality of the data were maintained by organizing the data by codes and keeping the names and addresses of the subjects in a separate, locked file. No names were attached to the questionnaires or Demographic Data Form.

In addition to protecting the subject's rights, steps were taken to prevent any hurt, harm, or discomfort to the subject. When possible, the interview sessions were held in the respective clinics. The researcher then had access to both the Clinic Coordinator and the hospital emergency department should there be a crisis. When the interview took place in the subject's home or workplace, the following steps were taken to manage a potential crisis:

1. The subject was asked prior to the commencement of the interview what symptom management strategies he/she had used in the past, and was encouraged to use these strategies should a symptom episode occur.

2. The researcher made sure that any medication the subject used during asthma or panic attacks was readily available.

3. The technique of three quick sniffs and an exhalation was encouraged as a symptom management strategy for VCD symptoms. This technique is used by speech pathologists and is known to be effective in alleviating symptoms quickly.

If the subject experienced a severe asthma episode during the interview evidenced by symptoms at rest, agitation, and difficulty speaking, and the reliever medication (bronchodilator) at maximum dosage was not effective, the researcher would have advised the subject to go to the hospital, and would have accompanied him or her if necessary. An ambulance would have been called if there was evidence of increased work in breathing such as the use of accessory respiratory muscles, fingers or lips being cyanosed, or the subject being drowsy or confused. It is important to note that the researcher was a registered nurse trained in cardiopulmonary resuscitation and had eight years experience as a primary mental health therapist.

CHAPTER 4

Findings

Demographic and Clinical Characteristics

Three hospital sites were targeted for subject recruitment; however, one site was unable to recruit subjects for the study during the four month recruitment time-frame. Although patients with VCD were seen at this site, they were under the age of 15 and were therefore not appropriate for this study. Subjects were thus recruited from only two sites which resulted in a smaller sample size than was originally expected.

Six subjects were enrolled in the study including two adolescent females, three adult females, and one adult male. One subject was recruited from a previous research study, the "Asthma-Anxiety Project" (Ross & Davis, 1997); two subjects were recruited from the Alberta Children's Hospital, Calgary; and three subjects were recruited from the Rockyview Hospital, Calgary.

Demographic characteristics are reported in Table 2 and include age, gender, previous diagnosis of Asthma, age at first diagnosis of Asthma, current diagnosis of Asthma, current use of Asthma medications, and current or past psychiatric diagnosis. The age of the subjects ranged from 16 to 63.

Current diagnoses and types of symptom episodes by subject are presented in Table 3. All of the subjects were previously diagnosed with VCD; however, Subjects 1 to 4 had received additional comorbid diagnoses of Asthma and/or Panic. One subject (S1) was diagnosed with Asthma and Panic; two subjects (S2 and S3) were diagnosed with Asthma; and one subject (S4) was diagnosed with Panic. Given these diagnoses,

Table 2

Demographic and Clinical Characteristics

Subject	S1	S2	S3	S4	S5	S6
Age	24	63	16	30	16	41
Gender	F	M	F	F	F	F
Previous Asthma Diagnosis	yes	yes	yes	no	no	yes
Age Asthma Diagnosis	10	60	8			5
Current Asthma Diagnosis	yes	yes	yes	no	no	no
Current Asthma Medication (past 6 months)	yes	yes	yes	yes	yes	no
History of Panic Attacks	yes	no	no	yes	no	no
Other Medical Disorders	no	no	no	no	no	yes*
Other Psychiatric Disorders	yes*	no	no	yes*	no	no

Note. * Psychiatric disorders for S1 are depression, post-traumatic stress disorder, and panic disorder; psychiatric disorder for S2 is panic disorder. Psychiatric disorders were subjectively reported with the exception of panic disorder which was diagnosed by researcher using the DSM-IV criteria and Panic Attack Questionnaire. Other medical disorder for S6 is self-reported anemia.

seven possible symptom episode types could be experienced by one or more subjects: (a) three types of "single diagnosis" symptom episodes [VCD, Asthma, and Panic]; and (b) four types of "combined diagnosis" symptom episodes [VCD / Asthma, VCD / Panic, Asthma / Panic, and VCD / Asthma / Panic]. However, as can be noted, none of the subjects experienced an Asthma / Panic symptom episode.

As shown in table 3, five of the six subjects (83%) reported experiencing at least one episode of VCD without symptoms of Panic or Asthma. Subject 4 experienced VCD only when combined with Panic. Subjects who were diagnosed with

Table 3

Current Diagnoses and Types of Symptom Episodes by Subject

Subject	Diagnoses	Types of Symptom Episodes						
		VCD	Asthma	Panic	VCD/ Panic	VCD/ Asthma	Asthma/ Panic	V/A/P
S1	VCD Asthma Panic	x	x	x	x	x	--	x
S2	VCD Asthma	x	x	--	--	--	--	--
S3	VCD Asthma	x	x	--	--	--	--	--
S4	VCD Panic	--	--	--	x	--	--	--
S5	VCD	x	--	--	--	--	--	--
S6	VCD	x	--	--	--	--	--	--
	% of subjects with diagnosis who experienced symptom episode at least once	5/6 (83%)	3/3 (100%)	1/2 (50%)	2/2 (100%)	1/3 (33%)	0	1/1*

Note. X's indicate that the subject experienced the symptom episode at least once. Dashes indicate that the subject never experienced the symptom episode.

* Percentage not applicable because only one subject could experience this symptom episode.

comorbid VCD and Panic (S1 and S4) experienced "combined diagnosis" symptom episodes of VCD / Panic. The subject with comorbid VCD, Asthma, and Panic (S1) reported experiencing six types of symptom episodes (VCD, Asthma, Panic, VCD /Asthma, VCD / Panic, and VCD / Asthma / Panic), but did not experience the "combined diagnosis" symptom episode of Asthma / Panic. All three of the subjects with a diagnosis of VCD and Asthma (S1, S2, and S3) experienced "single diagnosis" symptom episodes of VCD and Asthma ; however, only the subject with an accompanying diagnosis of Panic (S1) experienced a "combined diagnosis" symptom episode of VCD / Asthma.

Asthma Diagnoses and Medication

As shown in Table 2, four of the six subjects had a previous diagnosis of Asthma (S1, 2, 3, and 6); however, only three of the six subjects reported "still having Asthma" (S1, S2, and S3). Subject 1 was currently taking serevent, 50ug once daily; flovent inhaler, 250ug, 2 puffs once daily; and bricanyl turbuhaler, 1 puff daily. Subject 2 was taking pulmicort, 200mg, 2 puffs twice per day, but he did state that his physicians had not sorted out whether his symptoms were as the result of VCD, Asthma, or a combination of the two. He had been diagnosed with Asthma two years earlier at the age of 61. Subject 3 was currently taking flovent on an as needed basis, but had not taken any for four months. Although diagnosed with Asthma at age eight, her physicians were questioning whether current Asthma symptomatology may actually be VCD.

Subject 5, who did not have Asthma currently, was still taking Asthma medication (flovent 125ug, 2 puffs twice daily; and ventolin 2 puffs as needed). She had never received a conclusive Asthma diagnosis. Subject 4, although also never having being diagnosed with asthma, had previously been using a steroid inhaler for six months.

Psychiatric Diagnoses and Medication

The subjects (S1 and S4) with histories of panic attacks were diagnosed with panic disorder using the DSM-IV (APA, 1994) criteria. Subject 1 also reported suffering from depression and post-traumatic stress disorder. Subject 1 was currently taking effexor, 75mg once per day for her depression. Subject 4 was not on any psychotropic medication, but antidepressants had been recommended by her family physician.

Quantitative Data: Multiple Card Sort

The following sections present the multiple card sort data obtained on (a) the three types of typical/prototype "single diagnosis" symptom episodes, (b) the three types of typical/prototype "combined diagnosis" symptom episodes, and (c) the worst symptom episode ever experienced. Given the small sample size, the researcher elected to replace the mean rank order of symptoms with the range of the rank order of symptoms. Because the range of responses for symptom severity was small (1-5), the mean severity rating of symptoms was deemed appropriate to report.

Typical/Prototype "Single Diagnosis" Symptom Episodes

The three types of typical/prototype "single diagnosis" symptom episodes were VCD, Asthma, and Panic.

Typical VCD Symptom Episodes. Five subjects (S1, S2, S3, S5, and S6) reported experiencing typical "single diagnosis" VCD symptom episodes. The frequency, range order (1-41), and mean severity (1-5) of the VCD symptom episodes experienced by these subjects are reported by symptom in Table 4. As can be noted, the total number of symptoms experienced during a typical VCD symptom episode ranged from 4 to 14 (M = 8.2).

Comparison of the VCD episode symptoms experienced by these subjects to the 10 possible VCD symptoms (as per symptom cards - see Appendix J)) revealed the following:

1. Four of the 10 VCD symptoms were experienced by 4/5 subjects during a typical VCD episode. These included: "tightness in throat" (S1, S2, S3, and S5), "hoarseness" (S1, S2, S5, and S6), "wheezing breathing in" (S1, S2, S5, and S6), and "shortness of breath" (S1, S2, S3, and S5).

2. One VCD symptom, "tightness in upper chest", was not experienced by any of the subjects.

3. Five VCD symptoms were experienced by one or two of the five subjects. These included: "spitting up of food" (S1), "fear of choking" (S1 and S2), actual choking" (S2), "wheezing breathing out" (S2), and "need to cough breathe" (S2).

It is important to note that 4/5 subjects all reported experiencing the five following symptoms during a typical VCD episode: "wheezing breathing in", "tightness in throat", "hoarseness", "shortness of breath", and "difficulty breathing". Three of these symptoms are unique VCD symptoms ("wheezing breathing in", "tightness in throat", and "hoarseness"), one of these symptoms is an overlap Asthma symptom ("difficulty breathing"), and one is a common VCD / Asthma / Panic symptom ("shortness of breath").

When the order of presentation of the foregoing five symptoms was considered across subjects, the following was observed:

1. Three of the five symptoms ranged in rank order from 1 to 5 ("wheezing breathing in", "tightness in throat", and "hoarseness") indicating that they occurred early in the VCD episode.

2. From a phenomenological perspective, these symptoms occurred as follows: (a) "hoarseness" and "tightness in throat" consistently preceded "wheezing breathing in", and (b) "wheezing breathing in" consistently preceded "shortness of breath" and "difficulty breathing" (refer to Appendix M).

In terms of symptom severity, "hoarseness" was the most severe of the five most frequently reported symptoms ($\underline{M} = 4.0$) during typical VCD symptom episodes. The remaining four most frequently reported symptoms ranged in mean severity from 3.2 to 3.7.

Typical Asthma Symptom Episodes. Three subjects (S1, S2, and S3) reported experiencing typical "single diagnosis" Asthma symptom episodes. The frequency, range order (1-41), and mean severity (1-5) of these symptom episodes are reported by symptom in Table 5. As can be noted, the total number of symptoms experienced during a typical Asthma episode ranged from 7 to 13 (M = 10.6).

Comparison of the Asthma episode symptoms experienced by these subjects to the 23 possible Asthma symptoms (as per symptom cards - see Appendix J)) revealed the following:

1. Two of the 22 Asthma symptoms were experienced by all of the subjects during a typical Asthma episode. These were "wheezing breathing out" and "difficulty breathing".

2. Three of the 22 Asthma symptoms were experienced by 2/3 subjects during a typical asthma episode. These included: "cough" (S1 and S2), "shortness of breath" (S1 and S2), and "congestion" (S1 and S3).

3. Eight of the 22 Asthma symptoms were experienced by only one subject. These included: "worried about having an attack" (S2), "exhausted" (S1), "feeling irritable or cranky" (S3), "scared" (S1), "helpless" (S1), "tightness in lower chest" (S1), "headache" (S3), "chest pain" (S1), and "dizziness, unsteady" (S1).

4. The remaining 9 Asthma symptoms were not experienced by any of the subjects. These included: "tightness in upper chest", "fear of dying", fear of being left alone", "tingling or pins and needles", "numbness", "tired", "stomach cramps", "intestinal cramps", and "weak or no energy".

It is important to note that all of the subjects reported experiencing "wheezing breathing out" and "difficulty breathing", and 2/3 subjects reported experiencing the five following symptoms during a typical Asthma episode: "need to cough to breathe", "cough", "fear of losing control", "shortness of breath", and "congestion". Three of these seven symptoms are unique Asthma symptoms ("difficulty breathing", "cough", and "congestion"), one of these symptoms is an overlap Panic symptom ("fear of losing control"), one of these symptoms is an overlap VCD symptom ("need to cough to breathe"), one of these symptoms is a common VCD / Asthma symptom ("wheezing breathing out"), and one is a common VCD / Asthma / Panic symptom ("shortness of breath").

When the order of presentation of the foregoing seven symptoms was considered across subjects, the following was observed:

1. Five of the seven symptoms ranged in order from 1 to 9 ("wheezing breathing out", "difficulty breathing", "cough", "shortness of breath", and "congestion") indicating that they occurred early in the Asthma episode.

2. The symptom of "congestion" occurred as the first or second symptom in the Asthma episodes.

3. From a phenomenological perspective, it was noted that the order of symptoms was variable and had no consistent pattern.

In terms of symptom severity, three of the seven most frequently reported symptoms during typical Asthma symptom episodes had a mean severity rating of 4.0 ("cough", "shortness of breath", and "difficulty breathing"). The remaining four most frequently reported symptoms ranged in mean severity from 3.0 to 3.6.

Typical Panic Symptom Episodes (Appendix M). One subject (S1) reported experiencing typical "single diagnosis" Panic symptom episodes. As can be noted, the total number of Panic symptoms experienced by this subject was 16.

Comparison of the Panic episode symptoms experienced by this subject to the 23 possible symptoms (as per symptom cards - see Appendix J) revealed the following:

1. Nine of the 16 symptoms reported during the typical Panic symptom episode are unique Panic symptoms. These include: "nausea", "chills", "pounding heart", "fast heart", "fear of losing control", "hot flashes", "trembling or shaking", "feeling like things are not real", and "feeling unattached from oneself".

2. Two of the 16 symptoms ("spitting up of food" and "tightness in throat") reported during the typical Panic symptom episode are overlap VCD symptoms.

3. One of the 16 symptoms ("helpless") reported during the typical Panic symptom episode is an overlap Asthma symptom.

4. The remaining four of the 16 symptoms reported during the typical Panic symptom episode are common symptoms. The symptom "tightness in upper chest" is a common VCD / Asthma / Panic symptom, and the symptoms "scared", "dizziness, unsteady", and "tingling or pins and needles" are common Asthma / Panic symptoms.

When the order of presentation of the symptoms in the typical Panic symptom episode was considered, the following was observed:

1. The symptoms "feeling like things are not real" and "feeling unattached from oneself" were ranked ordered together as number 1 along with "hot flashes", and "chills", all of which are unique Panic symptoms.

2. The symptom "tightness in throat" was then rank ordered as number 2. This symptom is an overlap VCD symptom.

In terms of symptom severity, the highest severity ratings were given to the following symptoms: "fear of losing control" (4), "feeling unattached from oneself" (4), "helpless" (4), and "scared" (4).

Typical /Prototype "Combined Diagnosis" Symptom Episodes

The three types of typical/prototype "combined diagnosis" symptom episodes were VCD / Asthma, VCD / Panic, and VCD / Asthma/ Panic. Asthma / Panic episodes were not reported by any subject.

Typical VCD / Asthma Symptom Episodes (Appendix M). One subject (S1) reported experiencing VCD and Asthma symptom episodes in combination. The order of symptoms (1-41) and severity of symptoms (1-5) for this typical "combined diagnosis" VCD / Asthma symptom episode may be seen in Appendix M. As can be noted, the total number of symptoms experienced during this typical VCD / Asthma symptom episode was 19.

Comparison of the VCD / Asthma episode symptoms experienced by this subject to the 41 symptom cards and their accompanying diagnostic categories revealed the following:

1. Four of the 19 symptoms were unique VCD symptoms ("wheezing breathing in", "tightness in throat", "hoarseness", and "spitting up of food").

2. Five of the 19 symptoms were unique Asthma symptoms ("cough", "tired", "feeling irritable or cranky", difficulty breathing", and "congestion").

3. Three of the 19 symptoms were overlap Panic symptoms ("sweating", "hot flashes", and "fast heart").

4. One of the 19 symptoms, "wheezing breathing out", was a common VCD / Asthma symptom.

5. Four of the 19 symptoms were common Asthma / Panic symptoms ("tightness in lower chest", "dizziness, unsteady", "tingling or pins and needles", and "chest pain").

6. The remaining two symptoms were common VCD / Asthma / Panic symptoms ("tightness in upper chest" and "shortness of breath").

When the order of presentation was considered, an intertwining of VCD and Asthma symptoms was noted. More specifically, the unique Asthma symptom of "congestion" occurred first, followed by the unique VCD symptoms of "hoarseness" and "tightness in throat". The next symptom that occurred was the unique Asthma symptom of "cough", followed by the common VCD / Asthma / Panic symptom of "tightness in upper chest", and another unique VCD symptom "wheezing breathing in".

In terms of symptom severity, the following was observed:

1. A severity rating of "5" was given to the unique Asthma symptoms "cough" and "difficulty breathing".

2. A severity rating of "5" was given to the unique VCD symptom "tightness in throat".

3. Severity ratings of "4" were given to the following symptoms: (a) the unique VCD symptoms "hoarseness" and "wheezing breathing in", (b) the unique Asthma

symptom "tired", (c) the overlap Panic symptoms "fast heart" and "sweating", (d) the common VCD / Asthma symptom "wheezing breathing out", and (e) the common VCD / Asthma / Panic symptoms "tightness in upper chest" and "shortness of breath".

Typical VCD / Panic Symptom Episodes (Appendix M). Two subjects (S1 and S4) reported experiencing typical "combined diagnosis" VCD / Panic symptom episodes. A description of these episodes for both subjects according to the order and severity of symptoms is given in Table 6. As can be noted, the number of symptoms experienced during a typical "combined diagnosis" symptom episode of VCD / Panic were 16 (S1) and 19 (S4).

Comparison of the VCD /Panic episode symptoms experienced by the subjects to the 10 possible symptoms of VCD and the 23 possible symptoms of Panic (as per symptom cards - see Appendix J) revealed the following:

1. Two of the 10 VCD symptoms were experienced by both subjects. These were "tightness in throat" and "hoarseness".

2. Three of the 10 VCD symptoms were experienced by one subject. These included: "wheezing breathing in" (S1), "tightness in upper chest" (S4), and "shortness of breath" (S1).

3. Five VCD symptoms were not experienced by either subject. These included: "fear of choking", "actual choking", "spitting up of food", "wheezing breathing out", and "need to cough to breath".

4. Three of the 23 Panic symptoms were experienced by both subjects. These included: "scared", "trembling and shaking" and "fast heart".

5. 16 of the 23 Panic symptoms were experienced by at least one subject.

6. Four Panic symptoms were not experienced by any of the subjects. These included: "actual choking", "chest pain", "fear of losing control", "tightness in the lower chest", "fear of losing control", and "stomach cramps".

It is important to note that both subjects reported experiencing the seven following symptoms during a typical VCD / Panic episode: ""difficulty breathing", "tightness in throat", "scared", "helpless", "trembling or shaking", "fast heart", and "hoarseness". Two of these symptoms are unique VCD symptoms ("tightness in throat" and "hoarseness"), two of these symptoms are unique Panic symptoms ("trembling or shaking" and "fast heart"), two of these symptoms are overlap Asthma symptoms ("difficulty breathing" and "helpless"), and one of these symptoms is a common Asthma / Panic symptom ("scared").

Rank order and severity data for this group is mostly unreliable. One subject (S1) rank ordered 14/16 symptoms as number two, and the other subject (S4) rated 15/19 symptoms as "5" in severity. The one symptom that was given a severity rating of "5" by both subjects was "scared".

From a phenomenological perspective, it is important to note that unique VCD symptoms preceded unique Panic symptoms in both subjects. One subject (S1) experienced three unique VCD symptoms first ("wheezing breathing in", "tightness in throat", and ""hoarseness"). The other subject (S4) experienced one unique VCD symptom ("tightness in throat") and one common VCD / Asthma / Panic symptom ("tightness in upper chest") in the first four symptoms. For unknown reasons, the overlap Asthma symptoms “congestion” and “difficulty breathing” occurred first and second in Subject 4 who was a non-asthmatic patient.

Typical VCD / Asthma / Panic Symptom Episodes. The same subject (S1) that experienced VCD and Asthma in combination was the only subject that experienced VCD, Asthma, and Panic in combination. The order of symptoms (1-41) and severity of symptoms (1-5) for the typical “combined diagnosis” VCD / Asthma / Panic symptom episode may be seen in Appendix M. As can be noted, the total number of symptoms experienced during this typical VCD / Asthma / Panic symptom episode was 31.

Comparison of the VCD / Asthma / Panic episode symptoms experienced by this subject to the 41 symptom cards and their accompanying diagnostic categories revealed the following:

1. Six of the 31 symptoms were unique VCD symptoms (“wheezing breathing in”, “tightness in throat”, “hoarseness”, “fear of choking”, “need to cough to breath”, and “spitting up of food”).

2. Eight of the 31 symptoms were unique Asthma symptoms (“cough”, “headache”, “tired”, “helpless”, “weak or no energy”, “difficulty breathing”, “congestion”, and “exhausted”).

3. Nine of the 31 symptoms were unique Panic symptoms (“nausea”, “chills”, “sweating”, “feeling like things are not real”, “feeling unattached from oneself”, “trembling or shaking”, fast heart”, “hot flashes”, and “fear of losing control”).

4. One symptom was a common VCD / Asthma symptom ("wheezing breathing out").

5. Five symptoms were common Asthma / Panic symptoms ("tightness in lower chest", "scared", "dizziness, unsteady", "tingling or pins and needles", and "chest pain").

6. The remaining two of the 31 symptoms were common VCD / Asthma / Panic symptoms ("shortness of breath" and "tightness in upper chest").

In terms of order of presentation, the following was observed:

1. Similar to the typical VCD / Asthma combined symptom episode, the first symptom experienced was the unique Asthma symptom of "congestion".

2. The symptom "congestion" was first followed by the common VCD / Asthma / Panic symptom of "shortness of breath", and then followed by the unique Asthma symptoms "difficulty breathing" and "cough".

3. The unique VCD symptoms "tightness in throat", "wheezing breathing in", "tightness in upper chest", and "hoarseness" followed the above symptoms.

4. The nine unique Panic symptoms ranged in order from 8 to 21 with a mean order of 11.9 indicating that these symptoms came after the VCD and Asthma symptoms were experienced.

In terms of symptom severity, the following was observed:

1. A severity rating of "5" was given to the unique VCD symptom "wheezing breathing in".

2. A severity rating of "5" was given to the unique Asthma symptoms "cough" and "difficulty breathing".

3. A severity rating of "5" was given to the common VCD / Asthma / Panic symptom "shortness of breath".

4. Severity ratings of "4" were given to the following symptoms: (a) the unique VCD symptoms "hoarseness", "fear of choking", "tightness in throat", and "need to cough to breath", (b) the unique Asthma symptoms "congestion", "helpless", and "exhausted", (c) the unique Panic symptoms "feeling like things are not real", "feeling unattached from oneself", "trembling and shaking", and fear of losing control" (d) the common VCD / Asthma symptom "wheezing breathing out", (e) the common Asthma / Panic symptoms "scared" and ""dizziness, unsteady", and (f) the common VCD / Asthma / Panic symptom "tightness in upper chest".

Worst/Exemplar Symptom Episodes

Interpretation of the worst symptom episode by the subject and the clinician, and the final diagnostic outcome of the event are described in Table 7. When the interpretations of the worst symptom episode by the subject, the interpretations of the worst symptom episode by the clinician, and the final diagnostic outcome were compared, the following was observed:

1. Of the three subjects who were seen immediately in the emergency department or a medicenter, there was agreement between the subject and the clinician about diagnosis in two cases (S1 and S5). Subject 6, however, disagreed with the

clinician about the diagnosis of his/her symptoms. The subject believed it was a VCD symptom episode, but the clinician diagnosed the symptom episode as Asthma.

2. The final diagnostic outcome in 2/6 subjects (S2 and S5), after subsequent medical testing and evaluation by pulmonary and/or ears, nose, and throat specialists, differed from the subject's interpretation of the symptom episode. The two subjects had interpreted the worst symptom episode as Asthma when the final diagnostic outcome was VCD.

3. The clinician's interpretation of the symptom episode in 2/3 subjects (S5 and S6) who sought immediate medical attention differed from the final diagnostic outcome. With both subjects, the clinician interpreted the symptom episode as Asthma when the final diagnostic outcome was VCD.

The type of worst symptom episode for the purposes of this study was identified using the final diagnostic outcome listed in Table 7.The final diagnostic outcome was chosen in order that comparisons with the typical symptom episodes may be more accurately achieved. Of the six subjects who participated in the study, four subjects (S2, S3, S5, and S6) were given a final diagnosis of VCD, one subject (S1) was given a final diagnosis of Asthma, and one subject (S4) was given a final diagnosis of VCD / Panic.

Worst/Exemplar Symptom Episode - VCD. The frequency of symptoms, range order of symptoms (1-41), and mean severity rating of symptoms (1-5) for the worst/exemplar symptom episodes with the final diagnosis of VCD are reported by symptom in Table 8. As can be noted, the total number of symptoms experienced during the a worst symptom episode that had a final diagnosis of VCD ranged from 9 to 18 (M = 12.5).

Comparison of the worst symptom episode experienced by these subjects to the 10 possible VCD symptoms revealed the following:

1. One of the 10 VCD symptoms, "tightness in throat", was experienced by all of the subjects during a worst symptom episode with the final diagnosis of VCD.

2. Four of the 10 VCD symptoms were experienced by 3/4 subjects during a worst symptom episode with the final diagnosis of VCD. These included: "wheezing breathing in" (S2, S5, and S6), "hoarseness" (S2, S5, and S6), "need to cough to breath" (S2, S3, and S5), and "shortness of breath" (S2, S3, and S5).

3. Four of the 10 VCD symptoms were experienced by one or two of the four subjects. These included: "wheezing breathing out" (S2 and S6), "tightness in upper chest" (S2 and S5), "fear of choking" (S2 and S3), and "actual choking" (S2 and S3).

4) One VCD symptom, "spitting up of food" was not experienced by any of the subjects.

It is important to note that at all of the subjects reported experiencing the symptoms "tightness in throat" and "difficulty breathing", and 3/4 subjects reported experiencing the seven following symptoms during a worst symptom episode with the final diagnosis of VCD: "wheezing breathing in", "hoarseness", "need to cough to breathe", "cough", "worried about having an attack", "shortness of breath", and "exhausted". Four of these nine symptoms are unique VCD symptoms ("tightness in throat", "wheezing breathing in", "hoarseness", and "need to cough to breathe"), four of these symptoms are overlap Asthma symptoms ("difficulty breathing", "cough", "exhausted", and "worried about having an attack"), and one of these symptoms is a common VCD / Asthma / Panic symptom ("shortness of breath").

When the order of presentation of these nine symptoms across subjects was considered, the following was observed:

1. The symptom "tightness in throat" ranged in order from 3 to 4 indicating that it occurred near the beginning of the worst episode - VCD.

2. Four of the nine symptoms ranged in order from 1 to 9 ("hoarseness", "cough", "shortness of breath", and ""difficulty breathing") indicating that they also occurred early in the worst episode - VCD.

3. From a phenomenological perspective, rank ordering was variable, and no consistent pattern in the order of symptom presentation was noted.

In terms of symptom severity, four of the nine most frequently reported symptoms during the worst symptom episode with a final diagnosis of VCD had mean severity ratings from 4.0 to 4.5. These included: "wheezing breathing out", "tightness in throat", "hoarseness", and "shortness of breath". The remaining five most frequently reported symptoms ranged in severity from 2.6 to 3.7.

Worst/Exemplar Symptom Episode - Asthma. The order of symptoms (1-41) and severity of symptoms (1-5) for the worst/exemplar symptom episode with the final diagnosis of Asthma are reported by symptom in Table 9. As can be noted, the total number of symptoms experienced during this worst symptom episode that had a final diagnosis of Asthma was 14.

Comparison of the worst episode symptoms (Asthma) experienced by this subject to the 41 symptom cards and their accompanying diagnostic categories revealed the following:

1. Five of the 14 symptoms were unique Asthma symptoms ("congestion", "cough", "exhausted", "difficulty breathing", and "weak or no energy").

2. Two of the 14 symptoms were overlap VCD symptoms ("wheezing breathing in" and "need to cough to breathe").

3. One of the 14 symptoms was an overlap Panic symptom ("sweating").

4. One of the 14 symptoms was a common VCD / Asthma symptom ("wheezing breathing out").

5. Three of the 14 symptoms were common Asthma / Panic symptoms ("tightness in lower chest", chest pain", and "scared").

6. The remaining two symptoms were common VCD / Asthma / Panic symptoms ("tightness in upper chest" and "shortness of breath").

In terms of order of presentation, the unique Asthma symptom "congestion" was first followed by three common symptoms as follows: the common VCD / Asthma / Panic symptom "shortness of breath"; the common VCD / Asthma symptom "wheezing breathing out"; and the common VCD / Asthma / Panic symptom "tightness in upper chest". The fifth symptom that presented was the overlap VCD symptom "wheezing breathing in".

When considering the severity of symptoms in the subject who experienced Asthma as his/her worst symptom episode, the following was noted:

1. Two unique Asthma symptoms were given a severity rating of "5". These were "congestion" and "difficulty breathing".

2. Three common symptoms were given a severity rating of "5". These included: (a) the common VCD / Asthma symptom "wheezing breathing out", and (b) the common VCD / Asthma /Panic symptoms "tightness in upper chest" and "shortness of breath".

3. Three symptoms were given a severity rating of "4". These included: (a) the unique Asthma symptom "cough", (b) the overlap Panic symptom "sweating", and (c) the common VCD / Asthma / Panic symptom "tightness in upper chest".

Worst/Exemplar Symptom Episode - VCD / Panic. The order of symptoms (1-41) and severity of symptoms (1-5) for the worst/exemplar symptom episode with the final diagnosis of VCD / Panic are reported by symptom in Table 9. As can be noted, the total number of symptoms experienced during this worst symptom episode that had a final diagnosis of VCD / Panic was 18.

Comparison of the worst episode symptoms (VCD / Panic) experienced by this subject to the 41 symptom cards and their accompanying diagnostic categories revealed the following:

1. Seven of the 18 symptoms were unique Panic symptoms ("nausea", "chills", "sweating", "feeling like things are not real", "feeling unattached from oneself" "fast heart", and "trembling or shaking").

2. Two of the 18 symptoms were unique VCD symptoms ("tightness in throat" and "hoarseness").

3. Four of the 18 symptoms were overlap Asthma symptoms ("congestion", "worried about having an attack", "exhausted", and "fear of being left alone").

4. Three of the 18 symptoms were common Asthma / Panic symptoms ("numbness", "tingling or pins and needles", and "intestinal cramps").

5. The remaining two symptoms were common VCD / Asthma / Panic symptoms ("shortness of breath" and "tightness in upper chest").

In terms of order of presentation, the following was observed:

1. The overlap Asthma symptom "fear of being left alone" occurred first followed by the overlap Asthma symptom "worried about having an attack", and the unique VCD symptom "tightness in throat".

2. The unique Panic symptoms ranged in order from 7 to 18 with a mean order of 12.0 indicating that they occurred later in the worst symptom episode -VCD / Panic.

Symptom severity data was unreliable because the subject gave 12/18 (66%) symptoms a severity rating of "5".

Table 4

Typical VCD Symptom Episodes: Frequency, Order, and Severity of Symptoms

Symptom Criteria Diagnosis	Symptom	VCD Symptom Episodes N=5		
		F	range order (1-41)	M severity (1-5)
V	wheezing breathing in	4	1-4	3.2
V A	wheezing breathing out	2	2-4	4.0
V A P	tightness in upper chest	--	--	--
A P	tightness in lower chest	--	--	--
V	tightness in throat	4	1-5	3.7
V	hoarseness	4	1-3	4.0
V	fear of choking	2	9	2.0
V P	actual choking	1	11	2.0
V	need to cough to breathe	1	7	5.0
A P	intestinal cramps	--	--	--
A	cough	3	2-8	4.3
A	headache	1	5	5.0
A	tired	1	11	3.0
P	nausea	--	--	--
P	chills	--	--	--
P	sweating	--	--	--
P	pounding heart	--	--	--
A	weak or no energy	--	--	--
A	worried about having an attack	2	1-2	4.0
P	fear of losing control	1	14	4.0
A P	dizziness, unsteady	1	12	4.0
A P	tingling or pins and needles	1	10	3.0
P	fast heart	1	7	3.0
A P	chest pain	--	--	--
V A P	shortness of breath	4	3-10	3.5
A	difficulty breathing	4	4-6	3.5
A	congestion	--	--	--
A	exhausted	1	13	4.0

Note. Please see the next page for the continuation of Table 4.

Typical VCD Symptom Episodes: Frequency, Order, and Severity of Symptoms (continued)

Symptom Criteria Diagnosis*			Symptom	VCD Symptom Episodes N=5 F	range order (1-41)	M severity (1-5)
	A	P	numbness	--	--	--
		P	feeling like things are not real	--	--	--
		P	feeling unattached from oneself	--	--	--
		P	trembling or shaking	--	--	--
	A		fear of being left alone	--	--	--
	A		helpless	1	12	2.0
	A	P	scared	1	13	2.0
V			spitting up of food	1	8	1.0
	A	P	fear of dying	--	--	--
	A		feeling irritable or cranky	--	--	--
		P	hot flashes	--	--	--
		P	smothering sensations	--	--	--
	A	P	stomach cramps	--	--	--

Note. *Symptom Criteria Diagnosis represents what diagnostic category the symptom falls into according to the literature. V = VCD; A = Asthma; and, P = Panic. Dashes indicate the symptom was not experienced by any of the subjects. The Mean total number of symptoms (N=5) was 8.2.

Table 5

Typical Asthma Symptom Episodes: Frequency, Order, and Severity of Symptoms

				Asthma Symptom Episodes N=3		
Symptom Criteria Diagnosis			Symptom	F	range order (1-41)	M severity (1-5)
V			wheezing breathing in	1	2	5.0
V	A		wheezing breathing out	3	1-4	3.6
V	A	P	tightness in upper chest	--	--	--
	A	P	tightness in lower chest	1	6	4.0
V			tightness in throat	1	4	4.0
V			hoarseness	1	5	4.0
V			fear of choking	1	10	3.0
V		P	actual choking	1	11	3.0
V			need to cough to breathe	2	4-7	3.5
	A	P	intestinal cramps	--	--	--
	A		cough	2	3-8	4.0
	A		headache	1	7	4.0
	A		tired	--	--	--
		P	nausea	--	--	--
		P	chills	--	--	--
		P	sweating	1	10	3.0
		P	pounding heart	--	--	--
	A		weak or no energy	--	--	--
	A		worried about having an attack	1	6	3.0
		P	fear of losing control	2	5-13	3.0
	A	P	dizziness, unsteady	1	11	2.0
	A	P	tingling or pins and needles	--	--	--
		P	fast heart	1	9	2.0
	A	P	chest pain	1	7	3.0
V	A	P	shortness of breath	2	1-9	4.0
	A		difficulty breathing	3	3-5	4.0
	A		congestion	2	1-2	3.5
	A		exhausted	1	12	2.0

Note. Please see the next page for the continuation of Table 5.

Typical Asthma Symptom Episodes: Frequency, Order, and Severity of Symptoms (continued)

		Asthma Symptom Episodes N=3		
Symptom Diagnostic Criteria	Symptom	F	range order (1-41)	M severity (1-5)
A P	numbness	--	--	--
P	feeling like things are not real	--	--	--
P	feeling unattached from oneself	--	--	--
P	trembling or shaking	--	--	--
A	fear of being left alone	--	--	--
A	helpless	1	12	2.0
A P	scared	1	8	2.0
V	spitting up of food	--	--	--
A P	fear of dying	--	--	--
A	feeling irritable or cranky	1	6	5.0
P	hot flashes	--	--	--
P	smothering sensations	--	--	--
A P	stomach cramps	--	--	--

Note. *Symptom Criteria Diagnosis represents what diagnostic category the symptom falls into according to the literature. V = VCD; A = Asthma; and, P = Panic. Dashes indicate the symptom was not experienced by any of the subjects. The Mean total number of symptoms (N=3) was 10.

Table 6

Typical "Combined Diagnosis" Symptom Episodes of VCD / Panic: Description of Episodes According to Order and Severity of Symptoms

S1 Total # Symptoms = 16			S4 Total # Symptoms = 19		
Order	Symptom	Severity	Order	Symptom	Severity
1	wheezing breathing in	3	1	congestion	5
1	**tightness in throat ***	4	2	**difficulty breathing**	5
2	**hoarseness**	2	3	**tightness in throat**	5
2	pounding heart	3	4	tightness in upper chest	5
2	feeling irritable or cranky	2	5	**scared**	5
2	fear of losing control	3	6	worried about having attack	5
2	dizziness, unsteady	2	7	fear of dying	3
2	hot flashes	3	8	**helpless**	5
2	**fast heart**	4	9	sweating	5
2	shortness of breath	3	10	tingling or pins and needles	3
2	**difficulty breathing**	3	11	nausea	5
2	feeling things are not real	4	12	chills	5
2	feeling unattached from self	4	13	**trembling or shaking**	5
2	**trembling or shaking**	3	14	intestinal cramps	5
2	**helpless**	4	15	**fast heart**	2
2	**scared**	5	16	numbness	2
			17	**hoarseness**	5
			18	exhausted	5
			19	fear of being alone	5

Note. *Bold lettering indicates that both S1 and S4 reported these symptoms.

Table 7

Interpretation of the Worst Symptom Episode by Subject and Clinician, and Final Diagnostic Outcome

Subject	Medical Attention Sought	Symptom Episode Interpretation		Final Diagnostic Outcome
		by Subject	by Clinician*	
S1	yes	Asthma	Asthma	Asthma
S2	no	Asthma		VCD
S3	no	VCD		VCD
S4	no	VCD/Panic		VCD/Panic
S5	yes	Asthma	Asthma	VCD
S6	yes	VCD	Asthma	VCD

Note. * Clinician referred to as any healthcare provider the subject was seen by in an emergency department or a medicenter. Blank space indicates subject did not immediately seek medical attention.

Table 8

Worst Symptom Episodes (Final Diagnostic Outcome VCD): Frequency, Order, and Severity of Symptoms

		VCD N=4		
Symptom Diagnostic Criteria	Symptom	F	range order (1-41)	M severity (1-5)
V	wheezing breathing in	3	1-10	4.0
V A	wheezing breathing out	2	2-6	4.0
V A P	tightness in upper chest	2	5-14	3.5
A P	tightness in lower chest	--	--	--
V	tightness in throat	4	3-4	4.5
V	hoarseness	3	2-8	4.3
V	fear of choking	2	6-7	3.0
V P	actual choking	2	7-10	3.0
V	need to cough to breathe	3	5-9	3.0
A P	intestinal cramps	--	--	--
A	cough	3	1-6	3.0
A	headache	2	7-18	4.5
A	tired	1	13	2.0
P	nausea	--	--	--
P	chills	--	--	--
P	sweating	1	12	2.0
P	pounding heart	1	2	2.0
A	weak or no energy	1	11	3.0
A	worried about having an attack	3	1-11	3.7
P	fear of losing control	1	10	5.0
A P	dizziness, unsteady	1	8	2.0
A P	tingling or pins and needles	--	--	--
P	fast heart	--	--	--
A P	chest pain	--	--	--
V A P	shortness of breath	3	4-9	4.3
A	difficulty breathing	4	4-7	3.7
A	congestion	1	17	2.0
A	exhausted	3	1-15	2.6

Note. Please see the next page for the continuation of Table 8.

Worst Symptom Episodes (Final Diagnostic Outcome VCD): Frequency, Order, and Severity of Symptoms (continued)

				VCD N=4		
Symptom Diagnostic Criteria			Symptom	F (1-41)	range order (1-41)	M severity (1-5)
	A	P	numbness	--	--	--
		P	feeling like things are not real	--	--	--
		P	feeling unattached from oneself	--	--	--
		P	trembling or shaking	--	--	--
	A		fear of being left alone	--	--	--
	A		helpless	2	9-14	3.5
	A	P	scared	2	11-12	2.5
V			spitting up of food	--	--	--
	A	P	fear of dying	--	--	--
	A		feeling irritable or cranky	--	--	--
		P	hot flashes	--	--	--
		P	smothering sensations	--	--	--
	A	P	stomach cramps	--	--	--

Note. Dashes indicate the symptom was not experienced by any of the subjects. The Mean total number of symptoms for VCD (N=4) was 12.5.

Table 9

Worst Symptom Episodes (Final Diagnostic Outcomes Asthma and VCD / Panic): Frequency, Order, and Severity of Symptoms

		Asthma N=1		VCD / Panic N=1	
Symptom Diagnostic Criteria	Symptom	order (1-41)	severity (1-5)	order (1-41)	severity (1-5)
V	wheezing breathing in	5.0	3.0	--	--
V A	wheezing breathing out	3.0	5.0	--	--
V A P	tightness in upper chest	4.0	4.0	6.0	5.0
A P	tightness in lower chest	8.0	5.0	--	--
V	tightness in throat	--	--	3.0	5.0
V	hoarseness	--	--	16.0	3.0
V	fear of choking	--	--	--	--
V P	actual choking	--	--	--	--
V	need to cough to breathe	10.0	3.0	--	--
A P	intestinal cramps	--	--	12.0	5.0
A	cough	7.0	4.0	--	--
A	headache	--	--	--	--
A	tired	--	--	--	--
P	nausea	--	--	8.0	5.0
P	chills	--	--	7.0	5.0
P	sweating	9.0	4.0	11.0	5.0
P	pounding heart	--	--	--	--
A	weak or no energy	14.0	3.0	--	--
A	worried about having an attack	--	--	2.0	5.0
P	fear of losing control	--	--	--	--
A P	dizziness, unsteady	--	--	--	--
A P	tingling or pins and needles	--	--	10.0	2.0
P	fast heart	--	--	13.0	3.0
A P	chest pain	11.0	2.0	--	--
V A P	shortness of breath	2.0	5.0	4.0	3.0
A	difficulty breathing	6.0	5.0	--	--
A	congestion	1.0	5.0	5.0	4.0
A	exhausted	13.0	2.0	15.0	5.0

Note. Please see the next page for the continuation of Table 9.

Worst Symptom Episodes (Final Diagnostic Outcomes Asthma and VCD / Panic): Frequency, Order, and Severity of Symptoms (continued)

		Asthma N=1		VCD / Panic N=1	
Symptom Diagnostic Criteria	Symptom	order (1-41)	severity (1-5)	order (1-41)	severity (1-5)
A P	numbness	--	--	14.0	2.0
P	feeling like things are not real	--	--	17.0	5.0
P	feeling unattached from oneself	--	--	18.0	5.0
P	trembling or shaking	--	--	10.0	5.0
A	fear of being left alone	--	--	1.0	5.0
A	helpless	--	--	--	--
A P	scared	12.0	3.0	--	--
V	spitting up of food	--	--	--	--
A P	fear of dying	--	--	--	--
A	feeling irritable or cranky	--	--	--	--
P	hot flashes	--	--	--	--
P	smothering sensations	--	--	--	--
A P	stomach cramps	--	--	--	--

Note. Dashes indicate the symptom was not experienced by any of the subjects. The Mean total number of symptoms for Asthma (N=1) was 14. The Mean total # of symptoms for VCD / Panic (N=1) was 18.

Comparison of Symptoms in Typical Symptom Episodes of VCD, Asthma, Panic, VCD / Panic, VCD / Asthma, VCD / Asthma / Panic, and the Worst Symptom Episodes with the Final Diagnostic Outcome of VCD or Asthma

In this section, identification of symptom commonality and overlap is presented by comparing mean total number, frequency, range of order, and mean severity ratings of symptoms in all symptom episodes. Comparisons of frequency, range of order, and mean severity of symptoms address select symptoms that in any symptom episode had a high frequency (reported by greater than 50% of subjects), a high severity rating (4-5), or a high rank order (1-5).

Mean Total Number of Symptoms. The means for the total number of symptoms (1-41) for all typical and worst symptom episodes are listed in Table 10. The least number of symptoms ($\underline{M} = 8.2$) were reported by subjects with typical "single diagnosis" VCD symptom episodes. The typical "single diagnosis" Panic episode had the highest mean number of symptoms ($\underline{M} = 16.0$) for a single symptom episode. Although the symptom episode of typical "single diagnosis" Panic rated higher in the mean number of symptoms than the symptom episodes of typical "single diagnosis" Asthma, the typical "combined diagnosis" symptom episode of VCD / Asthma had a higher mean number of symptoms ($\underline{M} = 19.0$) than the typical "combined diagnosis" symptom episode of VCD / Panic ($\underline{M} = 17.5$).

The "combined diagnosis" symptom episode of VCD / Asthma / Panic had the highest mean number of symptoms ($\underline{M} = 31.0$). The worst symptom episode with the final diagnostic outcome of VCD / Panic ($\underline{M} = 18.0$) had the highest number of symptoms for worst episodes. The mean number of symptoms in the worst symptom episode with the final diagnostic outcome of VCD ($\underline{M}$ = 12.5) was slightly lower than the mean number of symptoms with the final diagnostic outcome of Asthma ($\underline{M}$ = 14). The typical "combined diagnosis" symptom episodes in general had higher means than both the typical "single diagnosis" symptom episodes and the worst symptom episodes.

Frequency of Symptoms. Frequencies of symptoms in typical symptom episodes of VCD, Asthma, Panic, VCD / Asthma, VCD / Panic, and VCD / Asthma / Panic, and worst symptom episodes with the final diagnostic outcome of VCD or Asthma are compared in Table 11. In the worst symptom episode, the unique VCD symptoms of "tightness in throat" (4/4 subjects) and "hoarseness" (3/4 subjects) were reported by subjects with the final diagnostic outcome of VCD and by the one subject with the final diagnostic outcome of VCD / Panic. The subject with Asthma as the final diagnostic outcome did not experience these symptoms during the worst symptom episode. In the typical "single diagnosis" symptom episodes of VCD, 4/5 subjects reported both "tightness in throat" and "hoarseness" while only 1/3 subjects reported these symptoms in the typical "single diagnosis" symptom episodes of Asthma. Although "tightness in throat" was reported by the subject with the typical "single diagnosis" symptom episode of Panic, "hoarseness" was not. Subjects experiencing "combined diagnosis" symptom episodes (VCD / Asthma, VCD / Panic, VCD / Asthma / Panic) reported both these symptoms.

The unique VCD symptom of "wheezing breathing in" was experienced by 3/4 subjects with VCD as the final diagnostic outcome in their worst symptom episode, and by 4/5 subjects with typical "single diagnosis" symptom episodes of VCD. This symptom was also reported in the "combined diagnosis" symptom episodes of "VCD /Asthma" and "VCD / Asthma / Panic", and by 1/2 subjects with the "combined diagnosis" symptom episode of "VCD / Panic". "Wheezing breathing in" was not reported by the subject with Asthma as her worst episode nor by the subjects with typical "single diagnosis" symptom episodes of Asthma (N=3) and Panic (N = 1). In contrast, the common VCD / Asthma symptom of "wheezing breathing out" was reported less frequently by subjects experiencing VCD (2/5 subjects), but was reported by all subjects experiencing Asthma either by itself or in combination with VCD and/or Panic. The common Asthma / Panic symptom of "tightness in lower chest" was only reported by those subjects with Asthma symptomatology.

The common VCD / Asthma / Panic symptom of "shortness of breath" and the unique Asthma symptom of "difficulty breathing" were reported at high frequencies in all symptom episodes with the exception of typical "single diagnosis" Panic. The common Asthma / Panic symptom of "chest pain" was only experienced in symptom episodes with an Asthma component. The unique Asthma symptom of "helpless", the common Asthma / Panic symptom of "scared", and the unique Panic symptom of "trembling" were reported in all of the subjects experiencing the "combined diagnosis" symptom episodes that included Panic and the "single diagnosis" symptom episode of Panic; however, they were reported less frequently in the typical "single diagnosis" symptom episodes of Asthma (1/3, 1/3, and 0/3 subjects respectively) and VCD (1/5, 1/5, 0/5 subjects respectively).

Range Order of Symptoms. The range of the rank order of symptoms (1-41) in typical "single diagnosis" symptom episodes of VCD, Asthma, Panic, typical "combined diagnosis" symptom episodes of VCD / Asthma, VCD / Panic, and VCD / Asthma / Panic, and worst symptom episodes with the final diagnostic outcome of VCD or Asthma are compared in Table 12. The symptoms of "tightness in throat", "wheezing breathing out", "hoarseness", and "cough" had the highest ranges of rank order for the worst symptom episode - VCD. This was also true for the typical "single diagnosis" symptom episode of VCD except for the symptom of "cough" which had a lower range of rank order. The symptom of "cough" in episodes with an Asthma component ranged from 4 to 7. The Asthma symptom of "congestion" had a rank order of either 1 or 2 for all symptom episodes with an Asthma component.

The symptoms of "feeling like things are not real", "feeling unattached from oneself", and "hot flashes" had a rank order of 1 or 2 in the typical symptom episodes of Panic and VCD/Panic. However, in the symptom episodes without a Panic component, these symptoms either did not occur ("feeling like things are not real" and "feeling unattached from oneself") or had a lower rank order ("hot flashes" - 11).

Mean Severity of Symptoms. The mean severity ratings of symptoms (1-5) in typical symptom episodes of VCD, Asthma, Panic, VCD / Asthma, VCD / Panic, and VCD / Asthma / Panic, and worst symptom episodes with the final diagnostic outcome of VCD or Asthma are listed in Table 13. Although the unique VCD symptoms of "tightness in throat" and "hoarseness" are less frequent in worst and typical "single diagnosis" Asthma symptom episodes, the mean severity ratings when they do occur are similar to that of worst and typical "single diagnosis" VCD symptom episodes. Symptom episodes with a Panic component have similar mean severity ratings with "tightness in throat", but lower mean severity ratings with "hoarseness".

The VCD, VCD / Panic, and Asthma worst symptom episodes had higher mean severity ratings in general. Although the unique VCD symptom of "wheezing breathing in" had a higher mean severity rating in the VCD worst symptom episode (N = 4, M = 4.0) than the Asthma worst symptom episode (N = 1, M = 3.0), the mean severity rating for this symptom was higher in the typical "single diagnosis" Asthma symptom episode (N = 3, M = 5.0) than in the typical "single diagnosis" VCD symptom episode (N = 5, M = 3.2). Similarly, the common VCD / Asthma symptom of "wheezing breathing out" had a higher mean severity rating in the Asthma worst symptom episode (M = 5.0) than the VCD worst symptom episode (M = 4.0), but a lower mean severity rating in the typical "single diagnosis" Asthma symptom episode (M = 3.6) than in the typical "single diagnosis" VCD symptom episode (M = 4.0). Neither "wheezing breathing in" nor "wheezing breathing out" were experienced in the VCD / Panic worst symptom episode.

The common Asthma / Panic symptom of "tightness in lower chest" was only present in symptom episodes with an Asthma component with mean severity ratings ranging from 3.0 to 5.0. The common VCD / Asthma / Panic symptom of "shortness of breath" and the unique Asthma symptom of "difficulty breathing" had higher mean severity ratings ranging from 4.0 to 5.0 in the symptom episodes with an Asthma component, while symptom episodes without an Asthma component ranged in mean severity from 3.0 to 4.0.

The unique VCD symptom of "need to cough to breath", although equal in mean severity for both Asthma and VCD worst symptom episodes (M = 3.0), was higher in mean severity for typical "single diagnosis" VCD symptom episodes (N = 5, M = 5.0) than typical "single diagnosis" Asthma symptom episodes (N = 3, M = 3.5). "Combined diagnosis" symptom episodes had higher mean severity ratings for the unique Asthma symptom of "cough" (M's = 5.0). For typical "single diagnosis" symptom episodes of Panic and typical "combined diagnosis" symptom episodes with a Panic component, high mean severity ratings (at least 4.0) were present for the unique Asthma symptom of "helpless" and the common Asthma / Panic symptom of "scared" while other symptom episodes without a Panic component had lower mean severity ratings for these symptoms (2.0 to 3.5).

Table 10

Comparison of Mean Total Number of Symptoms in Typical Symptom Episodes of VCD, Asthma, Panic, VCD/Panic, VCD/Asthma, and VCD/Asthma/Panic, and Worst Symptom Episodes with Final Diagnostic Outcome of VCD, VCD/Panic, or Asthma

Symptom Episode Type	Mean Total # Symptoms (1-41)
Worst Episode (VCD)	12.5
Worst Episode (Asthma)	14.0
Worst Episode (VCD / Panic)	18.0
Typical VCD	8.2
Typical Asthma	10.6
Typical Panic	16.0
Typical VCD/Asthma	19.0
Typical VCD/Panic	17.5
Typical VCD/Asthma/Panic	31.0

Table 11

Comparison of Frequency of Symptoms in Typical Symptom Episodes of VCD, Asthma, Panic, VCD/Panic, VCD/Asthma, and VCD/Asthma/Panic, and Worst Symptom Episodes with Final Diagnostic Outcome of VCD, VCD/Panic, or Asthma

	Worst Symptom Episodes (F)			Typical Symptom Episodes (F)					
	VCD	Asthma	VCD/ Panic	VCD	Asthma	Panic	VCD/ Asthma	VCD/ Panic	VCD/ Asthma/ Panic
	N=4	N=1	N=1	N=5	N=3	N=1	N=1	N=2	N=1
tightness in throat	4/4	--	x	4/5	1/3	x	x	2/2	x
hoarseness	3/4	--	x	4/5	1/3	--	x	2/2	x
wheezing breathing in	3/4	x	--	4/5	1/3	--	x	1/2	x
wheezing breathing out	2/4	x	--	2/5	3/3	--	x	--	x
tightness in upper chest	2/4	x	x	--	--	x	x	1/2	x
tightness in lower chest	--	x	--	--	1/3	--	x	--	x
shortness of breath	3/4	x	x	4/5	2/3	--	x	1/2	x
difficulty breathing	3/4	x	--	4/5	3/3	--	x	2/2	x
chest pain	--	x	--	--	1/3	--	x	--	x
congestion	1/4	x	x	--	2/3	--	x	1/2	x
cough	3/4	x	--	3/5	2/3	--	x	--	x
need to cough to breathe	3/4	x	--	1/5	2/3	--	--	--	x

Note. Please see next page for continuation of Table 11.

Comparison of **Frequency** of Symptoms in Typical Symptom Episodes of VCD, Asthma, Panic, VCD/Panic, VCD/Asthma, and VCD/Asthma/Panic, and Worst Symptom Episodes with Final Diagnostic Outcome of VCD, VCD/Panic, or Asthma (continued)

	Worst Symptom Episodes (F)			Typical Symptom Episodes (F)					
	VCD N=4	Asthma N=1	VCD/ Panic N=1	VCD N=5	Asthma N=3	Panic N=1	VCD/ Asthma N=1	VCD/ Panic N=2	VCD/ Asthma/ Panic N=1
helpless	2/4	--	--	1/5	1/3	x	--	2/2	x
scared	2/4	x	--	1/5	1/3	x	x	2/2	x
fear of losing control	1/4	--	--	1/5	2/3	x	x	1/2	x
feeling like things are not real	1/4	--	x	--	--	x	--	1/2	x
feeling unattached from oneself	1/4	--	x	--	--	x	--	1/2	x
pounding heart	1/4	--	--	--	--	x	--	1/2	--
tingling or pins and needles	1/4	--	x	1/5	--	x	x	1/2	x
trembling or shaking	1/4	--	x	--	--	x	--	2/2	x
hot flashes	--	--	--	--	--	x	x	1/2	x

Note. Dashes indicate that the symptom was not experienced. X's indicate that the symptom was experienced where N=1.

Table 12

Comparison of the Ranges of the Rank **Order** of Symptoms in Typical Symptom Episodes of VCD, Asthma, Panic, VCD/Panic, VCD/Asthma, and VCD/Asthma/Panic, and Worst Symptom Episodes with Final Diagnostic Outcome of VCD, VCD/Panic, or Asthma

	Worst Symptom Episodes (range order 1-41)			Typical Symptom Episodes (range order 1-41)					
	VCD	Asthma	VCD/ Panic	VCD	Asthma	Panic	VCD/ Asthma	VCD/ Panic	VCD/ Asthma/ Panic
	N=4	N=1	N=1	N=5	N=3	N=1	N=1	N=2	N=1
tightness in throat	3-4	--	3	1-5	4	2	3	1-2	5
hoarseness	2-8	--	16	1-3	5	--	2	2-17	6
wheezing breathing in	1-10	5	--	1-4	2	--	6	1	5
wheezing breathing out	2-6	3	--	2-4	1-4	--	10	--	5
tightness in upper chest	5-14	4	6	--	--	5	5	4	5
tightness in lower chest	--	8	--	--	6	--	9	--	5
shortness of breath	4-9	2	4	3-10	1-9	--	8	2	2
difficulty breathing	4-7	6	--	4-6	3-5	--	7	2	3
chest pain	--	11	--	--	7	--	14	--	9
congestion	17	1	5	--	1-2	--	1	1	1
cough	1-6	7	--	2-8	3-8	--	4	--	4

Note. Please see next page for continuation of Table 12.

Comparison of the Ranges of the Rank **Order** of Symptoms in Typical Symptom Episodes of VCD, Asthma, Panic, VCD/Panic, VCD/Asthma, and VCD/Asthma/Panic, and Worst Symptom Episodes with Final Diagnostic Outcome of VCD or Asthma (continued)

	Worst Symptom Episodes (range order 1-41)			Typical Symptom Episodes (range order 1-41)					
	VCD	Asthma	VCD/ Panic	VCD	Asthma	Panic	VCD/ Asthma	VCD/ Panic	VCD/ Asthma/ Panic
	N=4	N=1	N=1	N=5	N=3	N=1	N=1	N=2	N=1
need to cough to breathe	5-9	10	--	7	4-7	--	--	--	7
helpless	9-14	--	--	12	12	1	--	2-8	19
scared	11-12	12	--	13	8	1	17	2-5	11
fear of losing control	10	--	--	14	5-13	8	--	2	12
feeling like things are not real	--	--	17	--	--	1	--	2	12
feeling unattached from oneself	--	--	18	--	--	1	--	2	12
pounding heart	2	--	--	--	--	18	--	2	--
tingling or pins and needles	--	--	10	10	--	6	16	10	18
trembling or shaking	--	--	10	--	--	4	--	2-13	17
hot flashes	--	--	--	--	--	1	11	2	13

Note. Dashes indicate that the symptom was not experienced.

Table 13

Comparison of Mean Severity o[illegible]oms in Typical Symptom Episodes of VCD, Asthma, Panic, VCD/Panic, VCD/Asthma, and VCD/Asthma/Panic, and Worst Symptom Episodes with Final Diagnostic Outcome of VCD, VCD/Panic, or Asthma

	Worst Symptom Episodes (M severity 1-5)			Typical Symptom Episodes (M severity 1-5)					
	VCD N=4	Asthma N=1	VCD/ Panic N=1	VCD N=5	Asthma N=3	Panic N=1	VCD/ Asthma N=1	VCD/ Panic N=2	VCD/ Asthma/ Panic N=1
tightness in throat	4.5	--	5.0	3.7	4.0	3.0	5.0	4.5	4.0
hoarseness	4.3	--	3.0	4.0	4.0	--	4.0	2.5	4.0
wheezing breathing in	4.0	3.0	--	3.2	5.0	--	4.0	3.0	5.0
wheezing breathing out	4.0	5.0	--	4.0	3.6	--	4.0	--	4.0
tightness in upper chest	3.5	4.0	5.0	--	--	2.0	4.0	5.0	4.0
tightness in lower chest	--	5.0	--	--	4.0	--	3.0	--	3.0
shortness of breath	4.3	5.0	3.0	3.5	4.0	--	4.0	3.0	5.0
difficulty breathing	3.7	5.0	--	3.5	4.0	--	5.0	4.0	5.0
chest pain	--	2.0	--	--	3.0	--	3.0	--	3.0
congestion	2.0	5.0	4.0	--	3.5	--	3.0	5.0	4.0
cough	3.0	4.0	--	4.3	4.0	--	5.0	--	5.0

Note. Please see next page for continuation of Table 13.

Comparisons of Mean **Severity** of Symptoms in Typical Symptom Episodes of VCD, Asthma, Panic, VCD/Panic, VCD/Asthma, and VCD/Asthma/Panic, and Worst Symptom Episodes with Final Diagnostic Outcome of VCD, VCD/Panic, or Asthma (continued)

	Worst Symptom Episodes (M severity 1-5)			Typical Symptom Episodes (M severity 1-5)					
	VCD N=4	Asthma N=1	VCD/ Panic N=1	VCD N=5	Asthma N=3	Panic N=1	VCD/ Asthma N=1	VCD/ Panic N=2	VCD/ Asthma/ Panic N=1
need to cough to breathe	3.0	3.0	--	5.0	3.5	--	--	--	4.0
helpless	3.5	--	--		2.0	4.0	--	4.5	4.0
scared	2.5	3.0	--	2.0	2.0	4.0	3.0	5.0	4.0
fear of losing control	5.0	--	--	4.0	3.0	4.0	--	3.0	4.0
feeling like things are not real	--	--	5.0	--	--	3.0	--	4.0	4.0
feeling unattached from oneself	--	--	5.0	--	--	4.0	--	4.0	4.0
pounding heart	2.0	--	--	--	--	3.0	--	3.0	--
tingling or pins and needles	--	--	2.0	3.0	--	2.0	2.0	3.0	3.0
trembling or shaking	--	--	5.0	--	--	3.0	--	4.0	4.0
hot flashes	--	--	--	--	--	4.0	3.0	3.0	3.0

Note. Dashes indicate that the symptom was not experienced.

Qualitative Data: Descriptive Narratives

The open-ended questioning used in this study to explore symptom interpretation and symptom management outcomes revealed "rich" data about the lived experience of individuals experiencing symptom episodes of VCD, Asthma, Panic, VCD / Asthma, VCD / Panic, and/or VCD / Asthma / Panic. The depth of their pathos or profound suffering was evident in their descriptive narratives. Each individual involved in this study described primarily experiences with VCD with some differentiation of Asthma and Panic. It is hypothesized that VCD was the center of their focus because the symptoms are confusing and particularly distressful. In order to fully capture the "lived-throughness" (Van Manen, 1997) of the symptom episodes, the data is presented in three parts addressing onset and interpretation of symptoms, symptom management strategies to regain control, and the aftermath of the experience. It is hoped that this method of presentation will enable the reader to understand the complexities involved in interpreting and managing these symptoms.

Onset: "Oh my God, I can't breath!"

The most striking theme in the individual descriptions of VCD symptom onset was the "suddenness" in which the symptoms occurred. As one individual stated: "I thought this is not like an asthma attack like I have ever had before, and I thought why is it suddenly so weird and this so bad?" (S3). Although suddenness of onset was common amongst these individuals experiencing VCD symptoms, two such individuals also described living with underlying symptoms at all times as demonstrated in the following statements: "My whole life, I always had tension in my throat" (S6), and "I am always hoarse and it is always tight. Some days are worse than others" (S5).

Symptom Interpretation: "What's happening to me?"

In terms of symptom interpretation, two themes were apparent in the individual descriptions of symptom episodes with VCD symptomatology.

Panic: "What is it?" Firstly, there was confusion in the individual, especially prior to a VCD diagnosis, about what the symptoms actually were. The three subjects (S1, S2, and S3) who had confirmed Asthma diagnoses thought that their first attack of VCD was an Asthma attack, and were surprised and distressed when Asthma symptom management strategies, such as the use of bronchodilators, did not work. Such statements were made as, "I was really scared, it was so hard to breathe, and I thought it was an Asthma attack the whole time. It was so weird. I took an inhaler and it didn't go away" (S3); "I just think that I am dying" (S1); "I get really into bad shape and the pulmicort doesn't help. I mean it doesn't do anything" (S2); "At the time I thought it was Asthma, but in retrospect I see it was VCD" (S1); and, "I get almost the same symptoms as Asthma at times when I go into VCD and I'm not sure whether it's VCD or Asthma, but I'm a little bit more aware of the differences now. If it's hard to breathe in it's VCD, as opposed to breathing out which is Asthma" (S2).

Panic: Intersection with Health Care Professionals. Secondly, there was confusion in the healthcare professionals involved in assessing and treating these individuals during acute symptom episodes. Consider the following statements:

1. “The ambulance got there and they were so confused, just so confused. They were asking me questions and I’m trying to answer but I couldn’t talk because no sound would come out. So I’m trying real hard but the more I try the worse it is getting until it is out of control” (S6).

2. “They get very, very confused when you go to emergency” (S6).

3. “The thing that is hardest to take is that when they find your chest is clear and that there is no asthma, they accuse you of trying to make yourself sick to get attention” (S1).

4. “I was starting to get funny looks from the doctors because my lungs would be clear but I was still under distress” (S1).

5. “And they would say that your lungs are clear, but I would say I can’t breathe so let’s get on with it. They would do all the regular asthma treatments and I would still be complaining of throat tightness that they couldn’t control” (S1).

6. “They just thought I needed to relax” (S5).

Panic: The Influence of Others. It is not only the healthcare professionals’ confusion that is distressing for theses individuals, but also the confusion and panic in family members, friends, and coworkers. One person (S6) described having a VCD episode at work and having an increase in symptoms because of the panic her coworkers were experiencing watching her struggle to breathe. “Everybody wants me to go to emergency to get a ventilator or puffer or something. They can’t understand that yes I sound wheezy and sick, but if you leave me alone for 20 minutes I will be fine”.

The difficulty and often inability to speak while experiencing a VCD episode by itself or in combination with Asthma and/or Panic contributes to an increase in fear associated with the symptoms. Breathlessness is a frightening feeling for anyone. When faced with the possibility of concerned but misinformed healthcare professionals administering inappropriate treatments because they either do not believe you or you are unable to tell them differently, the fear is at risk of escalating. The suffering that is being experienced may also be dishonored by clinicians who dismiss the symptom episode as hysteria or attention-seeking. As one subject stated when describing her experience in an emergency department, "I am not coming in here pretending that I have something wrong with me. I am terrified enough because I am not able to breathe and I don't know why I am not breathing" (S1).

Striving for Control

Striving for control is a dominant theme in the descriptive narratives of these individuals. Because of the increasing awareness of VCD in the field of speech pathology, symptom management strategies have been developed for bringing the paradoxical vocal cord movement that interferes with breathing under control. Breathing, distraction, detachment, calming oneself, and drinking water are all strategies these individuals can use to regain control of their bodies during VCD episodes.

Interruption of Daily Life. Given the nature of the disorder and the respiratory distress that can happen, symptom management strategies can significantly impact daily life. For example, one individual (S2) is an athlete who experiences VCD when involved in strenuous activity, especially in competition when there is an increase in stress. For her, the management of her symptoms requires her to stop the activity she is doing, thereby impeding her progress in the sport. Most of the individuals involved in this study have at one time or another found that their mind has not been able to control their body as the body continually asserts itself as the dominating force. As one person described when talking about her friends and parents, "You know, they think if you remove your brain from your body you'll be okay, but it is like your brain is right there but your body is reacting anyway" (S3).

The Misunderstanding of Breathlessness. During those times when individual symptom management strategies have been ineffective, healthcare professionals are sought to help these individuals regain control of their breathing. It is at these times that it becomes apparent in these individuals' descriptive narratives how little healthcare professionals understand about lack of breath. To strive to control breathing and relax when one cannot breathe is a difficult task. It would therefore make sense that it would take great mental strength to overcome an acute VCD episode. While there is medication available to treat acute episodes of both Asthma and Panic at home and in hospital, such medication is not available for VCD. As one individual stated when talking about there not being an inhaler treatment for VCD, "It sucks!" (S3).

"This is an emergency! Why aren't they helping me?" Emergent care in the hospital is a source of frustration for the individuals involved in this study. Although helium has been used successfully to treat VCD symptoms, not all emergency departments have helium tanks immediately accessible. Because of confusion relating to symptom interpretation, symptom management strategies used by healthcare professionals in a number of cases were inappropriate and at times ethically questionable. Consider the following descriptions of emergency experiences:

1. "They never heard of VCD and wanted to treat my wheezing. When I told them what the problem was, they still tried to treat the wheezing. I believe his words were 'spoiled brat!' " (S1).

2. "I told them ventolin and cold air would make it worse. They said if I didn't cooperate I could leave. So I got mad and my symptoms increased, and he put the cold air on anyway" (S1).

3. "They were giving me oxygen and a pump and stuff, but that stuff can't help me. Nothing helped" (S6).

4. "When I'm at a hospital that doesn't know me, I have to explain what is going on which leads to a lot of power struggles you know" (S6).

5. "Typically it is like Asthma when it boils down to it. So the first thing they want to give you is the pump but it is not respiratory because the chest is fine. But they can see I am having a problem and I'm not acting so it has to be Asthma. You know what I mean. So the first thing they do is give you Asthma medicine and my biggest worry is that they are not being educated about this" (S6).

6. " One time I was admitted for three days on steroid therapy, and once the Asthma cleared up they couldn't figure out why I was still out of breath" (S1).

The Ultimate Fear. The most disturbing comment that one of the individuals involved in this study made that demonstrates so movingly the fear and frustration experienced by these patients was as follows: "I think that I only panic if I go to the hospital and I can't tell them what is happening to me and they will give me something that will kill me" (S6). This description of the ultimate fear is quite ironic. This particular individual has come to understand and accept that she will not die from a VCD episode. Rather, she will pass out and start breathing again. This, to her, would be more bearable than seeking help because seeking help in itself could mean death.

Aftermath: "It's over. Now what?"

The aftermath of a symptom episode for the individuals involved in this study has often led to increasing confusion, fear, and frustration. As one person stated: "Nothing was ever that unpleasant" (S3). Visits to community physicians were at times helpful in sorting out the diagnosis, but at times also unhelpful. For example, one individual (S5) described how her family doctor researched VCD, yet continued to be unsure of the diagnosis and kept this individual on Asthma medication.

Fear: "Will it happen again?". Fear of the symptoms associated with VCD has profoundly affected the lives of the individuals in this study. As one person stated, "I hate it and it sucks! Everybody else can still keep training and I can't, because if I do I will end up crying and crying, and crying 'cause it's so embarrassing" (S3). The hardest thing for another person (S4) was also the time and place where the episode happened, again because of the embarrassment.

One individual (S6) described how she does not go on holidays because of the fear that she will have a VCD attack, and the doctors at the hospital in the place she has traveled to will not know what to do. This particular subject has begun to carry a card with her indicating her speech pathologist's name to give to emergency personnel should she not be able to talk. However, this is only effective at one particular hospital

Fear of another attack is a theme that is consistent throughout the descriptive narratives of these individuals. "I think the biggest part of mine is the nervousness and the fear, I guess 'cause I am like afraid of it" (S3). The notion of the symptoms being "weird" is repeated numerous times. The definition of the word "weird" according to the Oxford English Dictionary (1950) includes the following: "fate, destiny", "supernatural, uncanny, unearthly", and "incomprehensible". The etymology or root of this word is "the sisters, fates, witches". It therefore makes sense that patients who describe VCD as "weird" would feel fear. It is an uncanny and fateful disorder in that it occurs suddenly and without warning. The unearthly and incomprehensibility of the disorder is revealed by the lack of understanding demonstrated by healthcare professionals. .

Living the Experience. Disturbances in one's body, disturbances in one's relationships with others, fear of one's own mortality, and profound vulnerability are all evidenced by these powerful descriptive narratives. Although it is vitally important to understand what the "single diagnosis" and "combined diagnosis" symptom episodes of VCD, Asthma, and Panic look like, and how they interrelate to each other, it is equally important to explore the "lived experience" of these individuals. Only by doing so will we begin to understand the complexities and human suffering involved in individuals diagnosed with VCD with or without Asthma and/or Panic.

CHAPTER 5

Summary, Discussion, and Implications

In this chapter, a summary of the significant findings in relation to each research question is presented. The findings are then discussed, along with limitations and recommendations for further research. Implications for nursing practice are then considered.

Summary

The specific research questions addressed in this study were:

1. What is the symptom constellation, order of symptom presentation, and symptom severity experienced by patients during a typical/prototype "single diagnosis" symptom episode?
2. What is the symptom constellation, order of symptom presentation, and symptom severity experienced by patients during a typical/prototype "combined diagnosis" symptom episode?
3. What is the symptom constellation, order of symptom presentation, and symptom severity experienced by patients in each of these four diagnostic groups during what they considered to be their "worst" symptom episode?
4. What is the overlap of symptoms among the symptom episodes?
5. What are the experiences of these patients in terms of symptom interpretation and symptom management outcomes?

In order to address Questions 1, 2, and 3, a summary of symptom constellation, order of symptom presentation, and symptom severity for all symptom episodes is presented in Table 14. The overlap of symptoms among the symptom episodes is identified in Table 15. The symptoms presented in Table 15 are those that in any symptom episode had a high frequency (reported by greater than 50% of the subjects), a high severity rating (4.0-5.0), or a high rank order (1.0-5.0). Common symptoms and overlap symptoms are addressed because both contribute to confusion in relation to diagnosis and symptom management strategies. Unique symptoms are also identified.

The unique experiences of the six individuals involved in this study in terms of symptom interpretation and symptom management outcomes are similar in nature and warrant further attention. The individuals' experiences with VCD were the focus of the semi-structured clinical interview. The themes extracted from these clinical interviews were (a) "suddenness" of onset of VCD symptoms; (b) confusion in the patient about what the symptoms represent in terms of diagnosis and management of symptoms; (c) confusion in the health care professionals giving emergent care about what the symptoms represent in terms of diagnosis; (d) confusion and panic in family members, friends, and coworkers that inadvertently increases the symptomatology in the individual experiencing the symptoms; (e) propensity for health care professionals to administer inappropriate treatment because of lack of knowledge and misinformation about VCD and VCD / Asthma / Panic symptom commonality and overlap; and (f) the significant impact that VCD has on the individual's daily life leading to profound suffering, and ongoing fear and frustration.

Table 14

Summary of Symptom Constellation, Order of Presentation, and Symptom Severity of Six Typical (VCD, Asthma, Panic, VCD/Asthma, VCD/Panic, VCD/Asthma/Panic) and Three Worst (VCD, Asthma, VCD/Panic) Symptom Episodes

Symptom Episode	Symptom Constellation	Order of Presentation	Symptom Severity	
	M Total # Symptoms (1-41)	Highest Range of Order	M Total Severity (1-5)	Highest Severity Rating
Worst - VCD N=4	12.5	4/4* tightness in throat 3/4 cough hoarseness congestion	3.3	4/4 tightness in throat difficulty breathing 3/4 hoarseness short of breath
Worst - Asthma N=1	14.0	congestion shortness of breath wheezing breathing out	3.7	wheezing breathing out tightness in lower chest shortness of breath difficulty breathing congestion
Worst - VCD/Panic N=1	18.0	fear of being left alone worried about having an attack tightness in throat	4.3	N/A**

Note. Please see next page for continuation of Table 14.

Summary of Symptom Constellation, Order of Presentation, and Symptom Severity of Six Typical (VCD, Asthma, Panic, VCD/Asthma, VCD/Panic, VCD/Asthma/Panic) and Three Worst (VCD, Asthma, VCD/Panic) Symptom Episodes (continued)

Symptom Episode	Symptom Constellation	Order of Presentation	Symptom Severity	
	M Total # Symptoms (1-41)	Highest Range of Order	M Total Severity (1-5)	Highest Severity Rating
Typical - VCD N=5	8.2	4/5 hoarseness tightness in throat wheezing breathing in	3.3	4/5 hoarseness tightness in throat wheezing breathing in
Typical - Asthma N=3	10.6	3/3 wheezing breathing out difficulty breathing	3.3	3/3 wheezing breathing out difficulty breathing
Typical - Panic N=1	16.0	chills hot flashes scared helpless feeling unattached from self feeling like things are not real	3.0	fear of losing control hot flashes feeling unattached from self helpless scared
Typical - VCD/ Asthma N=1	19.0	congestion hoarseness tightness in throat	3.7	cough tightness in throat

Note. Please see next page for continuation of Table 14.

Summary of Symptom Constellation, Order of Presentation, and Symptom Severity of Six Typical (VCD, Asthma, Panic, VCD/Asthma, VCD/Panic, VCD/Asthma/Panic) and Three Worst (VCD, Asthma, VCD/Panic) Symptom Episodes (continued)

Symptom Episode	Symptom Constellation	Order of Presentation	Symptom Severity	
	M Total # Symptoms (1-41)	Highest Range of Order	M Total Severity (1-5)	Highest Severity Rating
Typical - VCD/ Panic N=2	17.5	2/2 tightness in throat difficulty breathing scared	3.9	2/2 tightness in throat scared helpless
Typical - VCD/ Asthma/ Panic N=1	31.0	congestion shortness of breath difficulty breathing	3.7	wheezing breathing in cough shortness of breath difficulty breathing

Note. * Indicates the number of subjects reporting symptom per number of subjects experiencing symptom episode.
**N/A indicates data was non-applicable. 12/18 symptoms were rated as 5/5.

Table 15

Summary of Unique, Common, and Overlap Symptoms in Six Typical (VCD, Asthma, Panic, VCD/Asthma, VCD/Panic, VCD/Asthma/Panic) and Three Worst (VCD, Asthma, VCD/Panic) Symptom Episodes

Symptom Episode	Unique Symptoms	Common Symptoms	Overlap Symptoms
Worst - VCD N=4	tightness in throat wheezing breathing in hoarseness need to cough to breathe	wheezing breathing out (VA)* shortness of breath (VAP) tightness in upper chest (VAP)	difficulty breathing (A) cough (A) helpless (A)
Worst - Asthma N=1	congestion cough difficulty breathing	wheezing breathing out (VA) tightness in lower chest (AP) chest pain (AP) scared (AP) tightness in upper chest (VAP) shortness of breath (VAP)	wheezing breathing in (V) need to cough to breathe (V)
Worst - VCD/Panic N=1	feeling like things are not real feeling unattached from self trembling or shaking	tingling, pins and needles (AP) shortness of breath (VAP) tightness in upper chest (VAP)	congestion (A) fear of being left alone (A)

Note. Please see next page for continuation of Table 15.

Summary of Unique, Common, and Overlap Symptoms in Six Typical (VCD, Asthma, Panic, VCD/Asthma, VCD/Panic, VCD/Asthma/Panic) and Three Worst (VCD, Asthma, VCD/Panic) Symptom Episodes (continued)

Symptom Episode	Unique Symptoms	Common Symptoms	Overlap Symptoms
Typical - VCD N=5 (4/5)**	wheezing breathing in tightness in throat hoarseness	shortness of breath (VAP)	difficulty breathing (A) cough (A)
Typical - Asthma N=3 (2/3-3/3)	difficulty breathing cough congestion	wheezing breathing out (VA) shortness of breath (VAP)	need to cough to breath (V) fear of losing control (P)
Typical - Panic N=1	feeling like things are not real feeling unattached from self pounding heart fear of losing control hot flashes trembling or shaking	scared (AP) tingling, pins and needles (AP) tightness in upper chest (VAP)	tightness in throat (V) helpless (A)

Note. Please see next page for continuation of Table 15.

Summary of Unique, Common, and Overlap Symptoms in Six Typical (VCD, Asthma, Panic, VCD/Asthma, VCD/Panic, VCD/Asthma/Panic) and Three Worst (VCD, Asthma, VCD/Panic) Symptom Episodes (continued)

Symptom Episode	Unique Symptoms	Common Symptoms	Overlap Symptoms
Typical - VCD/Asthma N=1	VCD tightness in throat hoarseness wheezing breathing in Asthma difficulty breathing cough congestion	wheezing breathing out (VA) chest pain (AP) scared (AP) tingling, pins and needles (AP) tightness in lower chest (AP) tightness in upper chest (VAP) shortness of breath (VAP)	fear of losing control (P) hot flashes (P)
Typical - VCD/ Panic N=2	VCD tightness in throat hoarseness wheezing breathing in Panic fear of losing control feeling like things are not real feeling unattached from self pounding heart hot flashes trembling or shaking	scared (AP) tingling, pins and needles (AP) shortness of breath (VAP) tightness in upper chest (VAP)	difficulty breathing (A) congestion (A) helpless (A)

Note. Please see next page for continuation of Table 15.

Summary of Unique, Common, and Overlap Symptoms in Six Typical (VCD, Asthma, Panic, VCD/Asthma, VCD/Panic, VCD/Asthma/Panic) and Three Worst (VCD, Asthma, VCD/Panic) Symptom Episodes (continued)

Symptom Episode	Unique Symptoms	Common Symptoms	Overlap Symptoms
Typical VCD/ Asthma/ Panic N=1	VCD tightness in throat hoarseness wheezing breathing in need to cough to breathe Asthma helpless difficulty breathing congestion cough Panic fear of losing control feeling like things are not real feeling unattached from self pounding heart trembling or shaking hot flashes	wheezing breathing out (VA) scared (AP) tingling, pins and needles (AP) chest pain (AP) tightness in lower chest (AP) tightness in upper chest (VAP) shortness of breath (VAP)	

Note. * Indicates the following: V - VCD, A - Asthma, P - Panic, VA - VCD/Asthma, VP - VCD/Panic, AP - Asthma/Panic, VAP - VCD/Asthma/Panic

Discussion

The significance of reported symptoms and the influence of the patient's self-understanding of the reported symptoms are crucial to appropriate and successful treatment interventions (Benner, 1989; Giardino & Wolf, 1993). In order to more fully understand the complexities involved in symptom identification and symptom management of VCD with or without Asthma and/or Panic, two of the three constructs of the Symptom Interpretation Model (SIM) (Teel et al., 1997) were studied in relation to the above diagnoses. These were (a) interpretation (naming the symptom and attributing meaning), and (b) outcome (decision-making regarding action or no action).

The multiple card sorts provided an opportunity for the researcher to examine prototype and exemplar symptom experiences that are often hard to define (Shelley, 1994). Although this research technique was a useful process in identifying symptom constellation, rank order, and severity, there were some limitations in its' application. The symptoms used in the card sort were taken from various assessment tools in the literature and therefore, the phenomenology of the symptoms was imposed on the subjects. Subjects could have been encouraged to create their own symptom cards that would have more accurately defined their symptom experience; however, the difficulty in defining certain data is the reason why researchers have used the multiple card sort technique to begin with (Bilodeau and Degner, 1996; Burnard & Morrison, 1994; Canter, Brown, & Groat, 1985; Crow & Spicer, 1995; Degner & Sloan, 1992; Morrison & Bauer, 1993).

Two symptoms that were reported in almost all of the symptom episodes were "difficulty breathing" and "shortness of breath", both often referred to as "dyspnea". Although the symptom of "difficulty breathing" is identified in the literature as an Asthma symptom, and the symptom of "shortness of breath" is identified in the literature as a common symptom of VCD, Asthma, and Panic, the difference in the symptom definitions is unclear. Simon et al. (1989) found that many patients use a variety of expressions to describe dyspnea such as "chest tightness", "out of breath", and "smothering sensations". Although there have been studies in the literature addressing the measurement of dyspnea, there have only been two studies addressing the sensations associated with dyspnea. Simon et al. used normal volunteers to distinguish sensations of breathlessness after dyspnea was induced through various measures. Cluster analysis revealed distinct groups of descriptors, and the researchers concluded that "the term breathlessness may encompass multiple sensations and therefore, may not be explainable by a single physiological mechanism" (p. 1).

Simon et al. (1990) used the same descriptors as in their previous study with subjects suffering from several different disorders. The cluster analysis revealed an association between certain groups of descriptors and specific conditions. It is thus clear that differentiating between the symptoms of "difficulty breathing", "shortness of breath", "smothering sensations", "actual choking", "wheezing breathing in", "wheezing breathing out", "chest pain", "tightness in upper chest", and "tightness in lower chest" is a complex process. An understanding into the meaning of multiple sensations, however, could give us information about the different underlying mechanisms of VCD, Asthma, and Panic. Further refinement relative to the phenomenology of the symptoms used in the symptom cards is necessary.

The gender of the subjects recruited for this study is consistent with the literature (Newman, 1993). Five of the six subjects were female, and one subject was a health care professional which is also consistent with the literature (Newman). Two subjects had the psychiatric diagnosis of panic disorder, and one of these subjects also had comorbid depression and posttraumatic stress disorder. Although this is consistent with the literature, the absence of the diagnosis of conversion disorder is inconsistent (Barnes, Grob, Lachman, Marsh, & Loughlin, 1986; Christopher et al., 1983; Craig, Sitz, Squire, Smith, & Carpenter, 1992; Geist & Tallett, 1990; Harris & Richard, 1992; Kellman & Leopold, 1982; Lacy & McManis, 1994; Schalen, Andersson, & Eliasson, 1992). Also inconsistent with the literature is the absence of Asthma/Panic comorbidity and symptom episodes (Baron, 1994; Bussing, Burket, & Kelleher, 1996; Carr, Lehrer, & Hochron, 1992; Karajgi, Rifkin, Doddi, & Kolli, 1990; Ley, 1989; Pollack et al., 1996; Porzelius, Vest, & Nochomovitz, 1991; Schmaling & Bell, 1997; Shavitt, Gentil, & Croce, 1993; Shavitt, Gentil, & Mandetta, 1992; Yellowlees, Haynes, Potts, & Ruffin, 1988).

An interesting finding in this study was the overwhelming presence of stress and high achievement amongst the subjects. One subject was a competitive athlete of provincial caliber, one subject was an honors student with a course load exceeding the required number, two subjects were top company executives, one subject took in multiple foster children, and one subject was an operating room nurse. The relationship between high achievement and the presence of VCD merits further investigation.

The qualitative findings of this study demonstrate the confusion inherent in distinguishing the various "single diagnosis" and "combined diagnosis" symptom episodes. As seen in Table 7, and described in the descriptive narratives, confusion is experienced in the patient, his/her family and friends, the public, and the health care professionals involved in his/her emergent and after care. The confusion between VCD and Asthma in particular is consistent with the literature (Corren & Newman, 1992; Freedman, Rosenberg, & Schmaling, 1991; Logvinoff, Lau, & Weinstein, 1990; Martin, Blager, Gay, & Wood, 1987; Nahmias, Tansey, & Karetzky, 1994; Newman, Mason, & Schmaling, 1995; Niven, Roberts, Pickering, & Web, 1992; Wanger & Beam, 1992).

When considering the mean total number of symptoms, the order of presentation, and the symptom severity of the nine symptom episodes as demonstrated in Table 14, the following is observed:

1. The "combined diagnosis" symptom episodes tended to have more symptoms than the "single diagnosis symptom episodes.

2. Whenever Panic was experienced in combination with VCD and/or Asthma, the number of symptoms were increased.

3. The symptoms of "hoarseness", "tightness in throat", and "wheezing breathing in" were high in rank order and high in severity for symptom episodes with a VCD component.

4. The symptoms "wheezing breathing out" and "congestion" were high in rank order and high in severity for symptom episodes with an Asthma component.

5. Panic symptoms were high in rank order and high in severity for the typical "single diagnosis" Panic symptom episode. When combined with other diagnoses, the VCD and/or Asthma symptoms tended to occur first, and were higher in severity.

6. The symptoms of "difficulty breathing" and "shortness of breath" were high in severity and high in rank order in a number of symptom episodes; however, no pattern was observed that would indicate one was more prevalent than another in specific types of symptom episodes.

The above findings indicate that, for the individuals involved in this study, there were certain symptoms in VCD and Asthma symptom episodes that tended to be higher in rank order and higher in severity. This is helpful in differentiating the particular diagnoses. The findings also indicate in these subjects that if Panic is being experienced on its own, the unique symptoms of Panic will be at the forefront; however, if Panic is being experienced in combination with VCD and/or Asthma, the latter symptoms take precedence in terms of order and severity.

As can be noted in Table 15, there were a large number of symptoms common to VCD, Asthma, and Panic. These common symptoms occurred in most of the symptom episodes. This in itself indicates that for patients and health care professionals, distinguishing the types of symptom episodes is a complicated and confusing process made more difficult by the severe and sudden nature of the symptoms. To complicate matters further, symptoms unique to one diagnosis were often seen in a symptom episode of a different diagnosis. These overlap symptoms were not noted in the literature as common symptoms of both diagnoses.

When considering the symptoms that in any symptom episode had a high frequency (greater than 50%), a high severity rating (4-5) or a low rank order (1-5), the following commonalties and overlap were observed as identified in Table 15:

1. The unique VCD symptom of "hoarseness" did not overlap into any other diagnostic symptom episode except those with a VCD component.

2. The unique Asthma symptom of "helpless" was only present in symptom episodes with a Panic component. It was not present in any of the Asthma symptom episodes.

3. The unique Asthma symptoms of "tightness in lower chest" and "chest pain" did not overlap into different diagnostic symptom episodes except those with an Asthma component.

4. The unique Panic symptoms "trembling or shaking", "feeling unattached from oneself", "feeling like things are not real", and "pounding heart" did not overlap into different diagnostic symptom episodes except those with a Panic component.

5. The symptoms "cough", "need to cough to breathe", "congestion", tightness in throat", and "wheezing breathing in" all overlapped into different diagnostic categories although they were identified in the literature as unique to one particular diagnosis.

The above findings indicate that further research is necessary to validate the commonality and overlap of symptoms that have been described in this study. Dated symptom measurement and assessment tools such as the ASC may not fully encapsulate the symptom experience. Imposing the phenomenology of symptoms from the health care professionals perspective may interfere with accurate descriptions and may result in important differentiating constructs being missed. In developing these tools, it is important for researchers to consider comorbidity and to study symptoms from the patient's perspective. Symptoms can be more accurately identified leading to an increase in patients' and health care professionals confidence in their ability to distinguish between VCD, Asthma, and Panic. This, in turn, will help alleviate fear and frustration associated with confusion and inappropriate treatment strategies.

Limitations of Study

The identified limitations of this study are as follows:

1. The sample size for this study was expected to be at least 20. The small sample size of six had an impact on the data analysis. The findings would have been more valid if there had been at least four subjects per diagnostic category of VCD, VCD/Asthma, VCD/Panic, and VCD/Asthma/Panic.

2. The phenomenology of the symptom cards was imposed on the subjects. Another process might have been to have the subjects identify their own symptoms; however, symptoms may be hard for individuals to define.

3. Further research is required in relation to the process of differentiating and combining symptoms in order to improve accuracy in choosing the symptoms that the researcher will use on the symptom cards.

4. “Shaping” is a validity issue that was not controlled for. After the subject had completed one card sort, it was possible that they had been affected or “shaped” to some degree by the card sort experience.

Implications for Nursing Research and Practice

It is hoped that the preliminary findings from this study will be the precursor to further research studies being done on a larger scale to address symptom commonality and overlap in VCD, Asthma, and/or Panic, and to lay the groundwork for future inquiry into the nature of the relationship among these three disorders. By developing a clearer understanding of how these symptoms overlap and interact with each other, health care professionals and individuals experiencing these symptoms will be able to make more appropriate symptom management decisions. Flowcharts developed to guide diagnosis and treatment would be helpful in the emergent care of individuals experiencing acute symptom episodes.

The personal devastation experienced by the individuals involved in this study is also worthy of further attention. Health care professionals need to be empathic towards these patients whose lives have been significantly affected by these disorders. When a psychogenic disorder is comorbid with an organic disorder such as Asthma, attention is often directed to the physical disorder at the risk of ignoring a real and often emergent cascading array of symptoms. By honoring the patient’s lived experience, nurses and other health care professionals will help to decrease the profound suffering of individuals diagnosed with VCD with or without Asthma and/or Panic.

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Appendix A

Letter to Parents

October 1, 1998

Dear Parent or Guardian:

I am a Master of Nursing student at the University of Alberta. and have worked as a nurse for 16 years. I invite your teen to take part in a study I am doing on Vocal Cord Dysfunction (VCD). The purpose of this study is to understand how patients experience their symptoms. Health care workers may use the information from this study to help improve the care of patients with VCD.

If your teen is interested and you are willing to give permission, I will interview your teen for 1-3 hours at the voice clinic. During the interview, I will ask your teen to describe his or her symptom experiences. I will ask about the order symptoms occur, the nature of symptoms, and how your teen interprets and manages his/her symptoms. I also will ask about the effect of your teen's symptom management.

To learn more about the study or how your teen can enter the study, you can phone me collect at 403 929 6674.
Thank you for your consideration.

Sincerely,

Wendy Heffern, RN, BScN

Appendix B

Information Sheet and Consent Form (Adult and Mature Minor Version)

Calgary

Research Project Title: Symptom Experiences of Individuals Diagnosed with Vocal Cord Dysfunction with or without Asthma and/or Panic

Investigators:

Wendy A. Heffern RN, BScN MN Student Faculty of Nursing University of Alberta Phone: 929-6674	Pat Gilmore Manager, Speech Pathology Alberta Children's Hospital Calgary, Alberta Phone: 229-7046
Carolyn Ross, RN, PhD Associate Professor Faculty of Nursing University of Alberta Phone: 492-4894	Terry Davis, RN, PhD Professor Faculty of Nursing University of Alberta Phone: 492-0300

Affiliated Institutions:

Glenrose Rehabilitation Hospital, Edmonton
Rockyview Hospital, Calgary
Alberta Children's Hospital, Calgary

This consent form, a copy of which has been given to you, is only part of informed consent. It should give you the basic idea of what the research is about and what your participation will involve. If you would like more detail about something mentioned here, or information not included here, you should feel free to ask. Please take the time to read carefully and to understand any accompanying information.

Purpose

Patients with vocal cord dysfunction with or without asthma often have difficulty understanding and managing their symptoms. Vocal cord dysfunction and asthma symptoms can be frightening, especially when experienced together. Symptoms may be even more frightening if patients also experience panic.

For my Master's thesis, I have developed a card sort and interview that will help me understand your (your teen's) symptom experiences. I am hoping that the results from this study will help improve the care of patients with vocal cord dysfunction.

Procedures

If you decide to be in this study, I will interview you for 1-3 hours at the voice clinic. I will begin the interview by asking you questions about your medical history and any medications you are taking. I will then use a short questionnaire to find out if you have ever had panic. Before you fill out this questionnaire, I will ask you if you want to be told the results. If I think you have a panic disorder, it will be up to you to seek treatment from
your family doctor. Next, I will ask you to sort through symptom cards choosing cards that you feel match your symptoms of vocal cord dysfunction. Each symptom card has a different symptom on it. If you also have asthma or have experienced panic, I will ask you to sort through these cards more than once. Finally, I will ask you questions about how
you have managed your symptoms in the past. I will audiotape the interview to help me remember your answers.

Participation

Risks and Benefits

Being in this study is your choice. Although your participation involves no known risks, there is the potential for the interview to be upsetting because you will be talking about your symptoms. However, I have been a mental health therapist for eight years and am well qualified to help you cope should you become upset.Your participation in this study may be of some benefit to you. You may improve your understanding about your symptoms.

Compensation

In the event that you suffer injury as a result of participating in this research, no compensation will be provided for you by the researchers, the sponsors, the University of Alberta, or the Calgary Regional Health Authority. You still have all your legal rights. Nothing said here about treatment or compensation in any way alters your right to recover damages.

Confidentiality

Your name will not appear in this study. Only a code number will appear on any forms or question sheets. I will also use codes to identify tapes. I will erase your name and any other identifying material from the tapes. I will keep all tapes and notes in a locked cabinet for seven years after finishing the study. I will keep consent forms for at least five years and separate them and the code lists from the cabinet. I may use data for another study in the future if further ethics approval is received. I may publish the information and findings of this study or present them at a conference. However, I will not use your name or any material that will identify you.

Your signature on this form indicates that you have understood to your satisfaction the information regarding your participation in the research project and agree to participate as a subject. In no way does this waive your legal rights nor release the investigators, sponsors, or involved institutions from their legal rights and professional responsibilities. You are free to withdraw from the study at any time without jeopardizing your health care. You may withdraw by contacting me collect at 403-929-6674 or Pat Gilmore at 229-7046. Your continued participation should be as informed as your initial consent, so you should feel free to ask for clarification or new information throughout your participation. If you have further questions, please contact me (403-929-6674), Pat Gilmore (229-7046), or my supervisors Terry Davis (403-492-0300), or Carolyn Ross (403-492-4894).
If you have any questions concerning your rights as a possible participant in this research, please contact the Office of Medical Bioethics, Faculty of Medicine, The University of Calgary, at 220-7990.

(Name)	(Date)
(Signature of subject, or responsible proxy, if applicable)	(Date)
(Signature of Investigator)	(Date)
(Name of Witness)	(Date)

A copy of this consent form will be given to you. Please keep it for your records and future reference.

Appendix C

Information Sheet and Consent Form (Minor Version) - Calgary

Research Project Title: Symptom Experiences of Individuals Diagnosed with Vocal Cord Dysfunction with or without Asthma and/or Panic

Investigators:

Wendy A. Heffern RN, BScN
MN Student
Faculty of Nursing
University of Alberta
Phone: 929-6674

Pat Gilmore
Manager, Speech Pathology
Alberta Children's Hospital
Calgary, Alberta
Phone: 229-7046

Carolyn Ross, RN, PhD
Associate Professor
Faculty of Nursing
University of Alberta
Phone: 492-4894

Terry Davis, RN, PhD
Professor
Faculty of Nursing
University of Alberta
Phone: 492-0300

Affiliated Institutions:
Glenrose Rehabilitation Hospital, Edmonton
Rockyview Hospital, Calgary
Alberta Children's Hospital, Calgary

This consent form, a copy of which has been given to you, is only part of informed consent. It should give you the basic idea of what the research is about and what your teen's participation will involve. If you would like more detail about something mentioned here, or information not included here, you should feel free to ask. Please take the time to read carefully and to understand any accompanying information.

Purpose

Patients with vocal cord dysfunction with or without asthma often have difficulty understanding and managing their symptoms. This is to be expected. Vocal cord dysfunction and asthma symptoms can be frightening, especially when experienced together. Symptoms may be even more frightening if panic is also experienced.

For my Master's thesis, I have developed a card sort and interview that will help me understand your teen's symptom experiences. I am hoping that the results from this study will help improve the care of patients with vocal cord dysfunction.

Procedures

If your teen is interested in being in this study and you give your permission, your teen will take part in a 1-3 hour interview with the researcher (Wendy Heffern) at the voice clinic. He/she will be asked some questions at first about his/her medical history and any medications he/she is taking. A short questionnaire will be used to find out if he/she has ever had panic. Before your teen fills out the questionnaire, I will ask him/her and you if you want to be told the results. If I think your teen may have a panic disorder, it will be up to you to seek treatment for your teen from your family doctor. Next he/she will be asked to sort through symptom cards choosing cards that he/she feels match his/her symptoms of
vocal cord dysfunction. Each symptom card has a different symptom on it. He/she may be asked to sort through these cards more than once if he/she also has asthma or has experienced panic. Finally, he/she will be asked questions about how he/she has managed his/her symptoms in the past. The interview will be audiotaped.

Participation

Risks and Benefits

Being in this study is your teen's choice with your permission. Although his/her participation involves no known risks, there is the potential for the interview to be upsetting because symptoms are being discussed. The researcher is a qualified nurse and has worked as a mental health therapist for eight years, and is therefore well qualified to help your teen cope should he/she become upset.. Your teen's participation in this study may result in one benefit to him/her. He/she may improve his/her understanding about his/her symptoms.

Compensation

In the event that your teen suffers injury as a result of participating in this research, no compensation will be provided for you by the researchers., the sponsors, the University of Alberta, or the Calgary Regional Health Authority. You still have all your legal rights. Nothing said here about treatment or compensation in any way alters your right to recover damages.

Withdrawal

Even if your teen enters this study, he/she may refuse to answer any questions during the interview. He/she may withdraw from the study at any time, or you may withdraw him/her at anytime yourself.. You or your teen can withdraw by telling the nurse-researcher of your wish (403-929-6674). Taking part in this study or dropping out will not affect your teen's care at the clinic.

Confidentiality

Your teen's name will not appear in this study. Only a code number will appear on any forms or question sheets. The researcher will erase your teen's name and any other identifying material from the transcription of the tapes. All tapes, transcriptions, and notes will be kept in a locked cabinet separate from consent forms or code list for seven years after completion of the study. Consent forms will be kept for at least five years. Data may be used for another study in the future, if the researcher receives approval from the appropriate ethics review committee.

The information and findings of this study may be published or presented at conferences, but your teen's name or any material that may identify him/her will not be used.

All information that is relevant to the clinical or developmental status of the child will be filed on the Health Record. Sensitive information will be filed separately from the child's main Health Record and access will be restricted.

Your signature on this form indicates that you have understood to your satisfaction the information regarding your teen's participation in the research project and agree to allow your teen to participate as a subject. In no way does this waive your legal rights nor release the investigators, sponsors, or involved institutions from their legal rights and professional responsibilities. You are free to withdraw from the study at any time without jeopardizing your or your teen's health care. You may withdraw by contacting me collect at 403-929-6674 or calling Pat Gilmore at 229-7046. Your continued participation should be as informed as your initial consent, so you should feel free to ask for clarification or new information throughout your participation. If you have further questions, please contact me (403-929-6674), Pat Gilmore (229-7046), or my supervisors Terry Davis (403-492-0300), or Carolyn Ross (403-492-4894).

If you have any questions concerning your rights as a possible participant in this research, please contact the Office of Medical Bioethics, Faculty of Medicine, The University of Calgary, at 220-7990.

____________________ (Name) ________________ (Date)

____________________ (Signature of subject, or responsible proxy) ________________ (Date)

____________________ (Signature of Investigator) ________________ (Date)

(Name of Witness) (Date)

A copy of this consent form will be given to you. Please keep it for your records and future reference.

The investigator will, as appropriate, explain to your teen the research and his or her involvement and will seek his or her ongoing cooperation throughout the project.

Minor Assent

I agree to participate in the above study.

(Signature of Minor) (Date)

Appendix D

Information Sheet (Adult Version) - Edmonton

Research Project Title: Symptom Experiences of Individuals Diagnosed with Vocal Cord Dysfunction with or without Asthma and/or Panic

Investigators:

Wendy A. Heffern RN, BScN
MN Student
Faculty of Nursing
University of Alberta
Phone: 929-6674

Terry Davis, RN, PhD
Professor
Faculty of Nursing
University of Alberta
Phone: 492-0300

Carolyn Ross, RN, PhD
Associate Professor
Faculty of Nursing
University of Alberta
Phone: 492-4894

Affiliated Institutions:

Glenrose Rehabilitation Hospital, Edmonton
Rockyview Hospital, Calgary
Alberta Children's Hospital, Calgary

Purpose

Patients with vocal cord dysfunction with or without asthma often have difficulty understanding and managing their symptoms. Vocal cord dysfunction and asthma symptoms can be frightening, especially when experienced together. Symptoms may be even more frightening if patients also experience panic.

For my Master's thesis, I have developed a card sort and interview that will help me understand your (your teen's) symptom experiences. I am hoping that the results from this study will help improve the care of patients with vocal cord dysfunction.

Procedures

If you decide to be in this study, I will interview you for 1-3 hours at the voice clinic. I will begin the interview by asking you questions about your medical history and any medications you are taking. I will then use a short questionnaire to find out if you have ever had panic. Before you fill out this questionnaire, I will ask you if you want to be treatment from your family doctor. Next, I will ask you to sort through symptom cards choosing cards that you feel match your symptoms of vocal cord dysfunction. Each symptom card has a different symptom on it. If you also have asthma or have experienced panic, I will ask you to sort through these cards more than once. Finally, I will ask you questions about how you have managed your symptoms in the past. I will audiotape the interview to help me remember your answers.

Participation

Being in this study is your choice. Your participation involves no known risks. I am a qualified nurse and have worked as a mental health therapist for eight years. Your participation in this study may be beneficial for you. You may improve your understanding about your symptoms.

Even if you enter this study, you may refuse to answer any questions during the interview. You may withdraw from the study whenever. You can withdraw by telling me of your wish (403-929-6674). Taking part in this study or dropping out will not affect your care at the clinic.

Your name will not appear in this study. Only a code number will appear on any forms or question sheets. I will also use codes to identify tapes. I will erase your name and any other identifying material from the tapes. I will keep all tapes and notes in a locked cabinet for seven years after finishing the study. I will keep consent forms for at least five years and separate them and the code lists from the cabinet. I may use data for another study in the future if further ethics approval is received.

I may publish the information and findings of this study or present them at a conference. However, I will not use your name or any material that will identify you. If you have any questions or concerns about this study, you can contact me (403-929-6674) or my supervisors Terry Davis (403-492-0300) and Carolyn Ross (403-492-4894). If you have any questions concerning your rights regarding participation in this study, please contact the Office of Faculty of Nursing Ethics Committee, Faculty of Nursing, University of Alberta at 403-492-0839.

This letter was reviewed. Participant's Initial: _____ Researcher's Initial: _____

Appendix E

Information Sheet (Teen Version) - Edmonton

Research Project Title: Symptom Experiences of Individuals Diagnosed with Vocal Cord Dysfunction with or without Asthma and/or Panic

Investigators:

Wendy A. Heffern RN, BScN
MN Student
Faculty of Nursing
University of Alberta
Phone: 929-6674

Terry Davis, RN, PhD
Professor
Faculty of Nursing
University of Alberta
Phone: 492-0300

Carolyn Ross, RN, PhD
Associate Professor
Faculty of Nursing
University of Alberta
Phone: 492-4894

Affiliated Institutions:
Glenrose Rehabilitation Hospital, Edmonton
Rockyview Hospital, Calgary
Alberta Children's Hospital, Calgary

Purpose

Patients with vocal cord dysfunction with or without asthma often have difficulty understanding and managing their symptoms. This is to be expected. Vocal cord dysfunction and asthma symptoms can be frightening, especially when experienced together. Symptoms may be even more frightening if panic is also experienced.

For my Master's thesis, I have developed a card sort and interview that will help me understand your teen's symptom experiences. I am hoping that the results from this study will help improve the care of patients with vocal cord dysfunction.

Procedures

If your teen is interested in being in this study and you give your permission, your teen will take part in a 1-3 hour interview with the researcher (Wendy Heffern) at the voice clinic. He/she will be asked some questions at first about his/her medical history and any medications he/she is taking. A short questionnaire will be used to find out if he/she has ever had panic. Before your teen fills out the questionnaire, I will ask him/her and you if you want to be told the results. If I think your teen may have a panic disorder, it will be up to you to seek treatment for your teen from your family doctor. Next he/she

will be asked to sort through symptom cards choosing cards that he/she feels match his/her symptoms of
vocal cord dysfunction. Each symptom card has a different symptom on it. He/she may be asked to sort through these cards more than once if he/she also has asthma or has experienced panic. Finally, he/she will be asked questions about how he/she has managed his/her symptoms in the past. The interview will be audiotaped.

Participation

Being in this study is your teen's choice with your permission. His/her participation involves no known risks. The researcher is a qualified nurse and has worked as a mental health therapist for eight years. Your teen's participation in this study may result in one benefit to him/her. He/she may improve his/her understanding about his/her symptoms.

Even if your teen enters this study, he/she may refuse to answer any questions during the interview. He/she may withdraw from the study at any time, or you may withdraw him/her at anytime yourself.. You or your teen can withdraw by telling the nurse-researcher of your wish (403-929-6674). Taking part in this study or dropping out will not affect your teen's care at the clinic.

Your teen's name will not appear in this study. Only a code number will appear on any forms or question sheets. The researcher will erase your teen's name and any other identifying material from the transcription of the tapes. All tapes, transcriptions, and notes will be kept in a locked cabinet separate from consent forms or code list for seven years after completion of the study. Consent forms will be kept for at least five years. Data may be used for another study in the future, if the researcher receives approval from the appropriate ethics review committee.

The information and findings of this study may be published or presented at conferences, but your teen's name or any material that may identify him/her will not be used. If you or your teen have any questions or concerns about this study at any time, you can contact the researcher (403-929-6674) or the researcher's supervisors Terry Davis (403-492-0300) and Carolyn Ross (403-492-4894). If you or your teen have any questions concerning your rights regarding participation in this study, please contact the Office of Faculty of Nursing Ethics Committee, Faculty of Nursing, University of Alberta at 403-492-0839.

This letter has been reviewed. Parent's Initials: _____ Teen's Initials: _____
Researcher's Initials: _____

Appendix F

CONSENT FORM - Adult Version - Edmonton

Title of Project: Symptom Experiences of Individuals Diagnosed with Vocal Cord Dysfunction with or without Asthma and/or Panic

Principal Investigator: Wendy Heffern, RN, BScN
Master of Nursing Student
Faculty of Nursing
University of Alberta
Phone: (403) 929-6674

Co-Investigators: Terry Davis, RN, PhD
Professor
Faculty of Nursing
University of Alberta
Phone: (780) 492-0300

Carolyn Ross, RN, PhD
Associate Professor
Faculty of Nursing
University of Alberta
Phone: (780) 492-4894

Affiliations: Connie Zalmanowitz
Clinic Coordinator
Vocal Cord Dysfunction C
Glenrose Rehabilitation Ho
Phone: (780) 471-2262

Barbara Gilmurray
Voice Clinic Coordinator
Speech Language Pathology
Rockyview Hospital, Calgary
Phone: (403) 541-3193

Pat Gilmore
Manager
Speech Pathology
ACH, Calgary
Phone: (403) 229-7211

I understand I have been asked to be in a research study.	Yes	No
I have read and received a copy of the attached Information Sheet.	Yes	No
I understand the benefits and risks involved in taking part in this study.	Yes	No
I had the opportunity to ask questions and discuss this study.	Yes	No
I understand that I am free to refuse to participate and that I may withdraw from the study at any time. I know I do not need to give a reason for refusing or withdrawing, and that my choice will not affect my care.	Yes	No
I understand who will have access to information I give to the researcher.	Yes	No
I understand information about me will be kept confidential.		
I understand information from this study might be used in future studies.	Yes	No
I understand interviews will be audiotaped.	Yes	No

This study was explained to me by: ______________________________

I agree to take part in this study.

Signature of Research Participant	Date	Witness
Printed Name		Printed Name

I give permission to Wendy Heffern to contact me in the future to be part of another nursing study.

Signature of Research Participant	Date	Witness

I believe that the person signing this form understands what is involved in the study and voluntarily agrees to participate.

Signature of Investigator	Date

Appendix G

CONSENT FORM - Parent and Teen Version - Edmonton-

Title of Project: Symptom Experiences of Individuals Diagnosed with Vocal Cord Dysfunction with or without Asthma and/or Panic

Principal Investigator:
Wendy Heffern, RN, BScN
Master of Nursing Student
Faculty of Nursing
University of Alberta
Phone: (403) 929-6674

Co-Investigators:

Terry Davis, RN, PhD
Professor
Faculty of Nursing
University of Alberta
Phone: (403) 492-0300

Carolyn Ross, RN, PhD
Associate Professor
Faculty of Nursing
University of Alberta
Phone: (403) 492-4894

Affiliations:

Connie Zalmanowitz
Clinic Coordinator
Vocal Cord Dysfunction C
Glenrose Rehabilitation Ho
Phone: (780) 471-2262

Barbara Gilmurray
Voice Clinic Coordinator
Speech Language Pathology
Rockyview Hospital, Calgary
Phone: (403) 541-3193

Pat Gilmore
Manager
Speech Pathology
ACH, Calgary
Phone: (403) 229-7211

I understand my teen has been asked to be in a research study.	Yes	No
I have read and received a copy of the attached Information Sheet.	Yes	No
I understand the benefits and risks involved in my teen taking part in this study.	Yes	No
I had the opportunity to ask questions and discuss this study.	Yes	No
I understand that I am free to refuse my teen's participation and that my teen may withdraw from the study at any time. I know I do not need to give a reason for refusing or withdrawing, and that my choice will not affect my teen's care.	Yes	No
I understand who will have access to information my teen gives to the researcher.	Yes	No
I understand information about my teen will be kept confidential.		
I understand information from this study might be used in future studies.	Yes	No
I understand interviews will be audiotaped.	Yes	No

This study was explained to me by: ______________________________

I agree to allow my teen to take part in this study.

Signature of Parent	Date	Witness
Printed Name		Printed Name

I assent to taking part in the above study and have read the attached information sheet.

Signature of Teen	Date	Witness
Printed Name		Printed Name

I give permission to Wendy Heffern to contact me in the future to ask my teen to be part of another nursing study.

Signature of Parent	Date	Witness

I believe that the persons signing this form understand what is involved in the study and voluntarily agree to participate.

Signature of Investigator	Date

Appendix H

Demographic Data Form

Subject #: _____

Age: _____ Gender: _____ Marital Status: _____

Occupation: ________________________________

Brief Medical History:

Brief Psychiatric History:

Current Medical Illnesses:

Current Medications:

Appendix I

PANIC ATTACK QUESTIONNAIRE

(Questions 2 to 7)

A panic attack is the sudden onset of intense apprehension, fear, or terror, often associated with feelings of impending doom. Some of the most common symptoms experienced during an attack are: dizziness, shortness of breath, chest pain or discomfort, and trembling or shaking.

---

(2) Have **YOU** ever had one or more panic attacks? Yes _____ No _____

If you have experienced one or more panic attacks in the PAST YEAR please answer **ALL** the remaining questions. If you have not experienced a panic attack or have only experienced a panic attack in a life threatening situation, please go on to the next questionnaire.

a. In the **PAST YEAR** approximately how many panic attacks have you had? (*please circle*)

1 2 3 4 5 6 7 8 9 10 more than 10

If more than 10, how many? ___________________

b. In the **PAST FOUR WEEKS** how many panic attacks have you had?

1 2 3 4 5 6 7 8 9 10 more than 10

If more than 10, how many? ___________________

c. In the **PAST WEEK** how many panic attacks have you had?

1 2 3 4 5 6 7 8 9 10 more than 10

If more than 10, how many? ___________________

3. a. For approximately how many **MONTHS OR YEARS** have you been experiencing panic attacks?

   ___________ years ___________ months

   b. What age were you when you had your first panic attack? __________

4. a. Have panic attacks occurred **MORE** frequently at some time in the past? Yes ____ No____

   b. Do you think the panic attacks are becoming more frequent? Yes ____ No____

   c. Do you think the panic attacks are becoming more intense? Yes ____ No ___

5. What types of places or situations are you avoiding specifically because of **fear of having a panic attack?**

   ____

   ____

   ____

   ____

6. Please indicate how severely you experience each of the following symptoms **WHEN YOU ARE HAVING** a panic attack.

		Does not occur	Mild	Moderate	Severe	Very severe
a.	**difficulty breathing**	**0**	**1**	**2**	**3**	**4**
b.	**heart pounding**	**0**	**1**	**2**	**3**	**4**
c.	**chest pain or discomfort**	**0**	**1**	**2**	**3**	**4**
d.	**choking or smothering sensations**	**0**	**1**	**2**	**3**	**4**
e.	**dizziness, vertigo, or unsteady feelings**	**0**	**1**	**2**	**3**	**4**
f.	**feelings of not being in one's body**	**0**	**1**	**2**	**3**	**4**
g.	**tingling in hands or feet**	**0**	**1**	**2**	**3**	**4**
h.	**hot and cold flashes**	**0**	**1**	**2**	**3**	**4**
i.	**sweating**	**0**	**1**	**2**	**3**	**4**
j.	**faintness**	**0**	**1**	**2**	**3**	**4**
k.	**trembling or shaking**	**0**	**1**	**2**	**3**	**4**
l.	**fears of death or serious illness**	**0**	**1**	**2**	**3**	**4**
m.	**fear of going crazy**	**0**	**1**	**2**	**3**	**4**
n.	**fear of doing something uncontrolled**	**0**	**1**	**2**	**3**	**4**
o.	**feeling of nausea**	**0**	**1**	**2**	**3**	**4**
p.	**visual difficulties (e.g., blurring)**	**0**	**1**	**2**	**3**	**4**
q.	**auditory difficulties (e.g., ringing in ears)**	**0**	**1**	**2**	**3**	**4**
r.	**difficulty concentrating**	**0**	**1**	**2**	**3**	**4**
s.	**extremely rapid heartbeat**	**0**	**1**	**2**	**3**	**4**
t.	**fear of causing a scene**	**0**	**1**	**2**	**3**	**4**

u.	**feeling of anger**	**0**	**1**	**2**	**3**	**4**
v.	**thought of escape**	**0**	**1**	**2**	**3**	**4**
w.	**flushing**	**0**	**1**	**2**	**3**	**4**
x.	**fear of drawing attention to oneself**	**0**	**1**	**2**	**3**	**4**
y.	**mouth feels dry**	**0**	**1**	**2**	**3**	**4**
z.	**feeling of helplessness**	**0**	**1**	**2**	**3**	**4**

Other Symptoms ***(please describe)***

____

____

____

7. a. What is the **most severe** panic symptom or symptoms you experience?

____

____

b. What is the first panic symptom you notice?

____

____

c. What is the most frightening panic symptom for you?

____

____

d. Please list any other feelings or sensations that signal the onset of a panic attack for you.

____

____

Appendix J

Symptoms According to Diagnostic Categories

Vocal Cord Dysfunction

11 Symptoms According to Blager's Clinical Presentations and Newman's Clinical Features

(Combined into 10 Symptoms)

[**Bold lettering** refers to symptoms previously identified]

11 Symptoms (as per Blager/Newman)	**10 Symptoms (as per study)**
tightness in throat	tightness in throat
hoarseness	hoarseness
fear of choking	fear of choking
choking	actual choking
gastro reflux	spitting up of food
stridor on inspiration	wheezing breathing in
sridor on expiration	wheezing breathing out
upper chest tightness	tightness in upper chest
need to cough to open airway	need to cough to breathe
wheezing	**wheezing breathing in**
	wheezing breathing out
shortness of breath	shortness of breath

Asthma

36 Symptoms According to the Asthma Symptom Checklist

(Combined into 22 Symptoms)

36 Symptoms (as per ASC)	**23 Symptoms (as per study)**
cramps	stomach cramps
	intestinal cramps
cranky	feeling irritable or cranky
edgy	*
frustrated with things	*
irritable	*
short-tempered	*
chest congestion	congestion
chest filling up	*
mucous congestion	*
tired	tired
weak	weak or no energy
no energy	*
exhausted	exhausted
fatigued	**tired**
	weak or no energy
	exhausted
worn out	*

Continued on Next Page

frightened	fear of being left alone
	scared
	fear of dying
nervous	*
worried	*
panicky	*
uncomfortable	*
scared	*
worried about having an attack	worried about having an attack
helpless	helpless
numbness	numbness
wheezing	**wheezing breathing out**
chest tightening	tightness in lower chest
	tightness in upper chest
pins and needles	tingling or pins and needles
tingling in spots	*
headache	headache
hard to breath	difficulty breathing
short of breath	**shortness of breath**
chest pain	chest pain
afraid of dying	**fear of dying**
afraid of being left alone	**fear of being left alone**
dizzy	dizziness, unsteady
coughing	cough

Panic

13 Symptoms According to the DSM-IV Criteria for Panic Attacks

(Further Differentiated into 18 Symptoms)

13 Symptoms (as per DSM-IV)	**23 Symptoms (as per study)**
palpitations, pounding heart, or accelerated	pounding heart
heart rate	fast heart
sweating	sweating
chills or hot flushes	chills
	hot flashes
trembling or shaking	trembling or shaking
sensations of shortness of breath or smothering	**shortness of breath**
	smothering sensations
feeling of choking	**actual choking**
chest pain or discomfort	**chest pain**
	tightness in upper chest
	tightness in lower chest
nausea or abdominal distress	nausea
	intestinal cramps
	stomach cramps
feeling dizzy, unsteady, lightheaded, or faint	**dizziness, unsteady**
derealization or depersonalization	feeling like things are not real
	feeling unattached from oneself

Continued on Next Page

fear of losing control or going crazy	fear of losing control
fear of dying	**fear of dying**
	scared
paresthesias	**numbness**
	tingling or pins and needles

Appendix K

41 Symptom Cards

wheezing breathing in
tightness in throat
hoarseness
spitting up of food
intestinal cramps
cough
headache
tired
fear of dying
dizziness, unsteady
chills
sweating
pounding heart
scared
feeling like things are not real
worried about having attack
smothering sensations
feeling unattached from oneself
shortness of breath
fear of choking
stomach cramps

wheezing breathing out
tightness in upper chest
actual choking
tightness in lower chest
feeling irritable or cranky
need to cough to breathe
weak or no energy
trembling or shaking
fear of losing control
numbness
hot flashes
tingling or pins and needles
fast heart
chest pain
congestion
exhausted
helpless
nausea
difficulty breathing
fear of being left alone

Appendix L

Data Collection Form

CODE ________

________________________________ ________________________________

Symptoms	Severity	Symptoms	Severity

COMMENTS:

Appendix M

Symptom Episode Data

				Typical VCD Symptom Episodes			
	Subject #	**1**	**2**	**3**	**4**	**5**	**6**
SYMPTOM	**Total#Sym**	13	14	4	None SeeVCD/Panic	5	5
wheezing beathing in	order	4	3			4	1
	severity	3	4			5	3
wheezing breathing out	order		4				2
	severity		5				3
tightness in upper chest	order						
	severity						
tightness in lower chest	order						
	severity						
tightness in throat	order	1	5	2		3	
	severity	5	4	4		2	
hoarseness	order	2	1			1	3
	severity	3	5			4	4
fear of choking	order	9	9				
	severity	1	3				
actual choking	order		11				
	severity		2				
spitting up of food	order	8					
	severity	1					
need to cough to breathe	order		7				
	severity		5				
intestinal cramps	order						
	severity						
stomach cramps	order						
	severity						
cough	order	3	8			2	
	severity	4	5			4	
headache	order						5
	severity						5

	Subject #	1	2	3	4	5	6
tired	order	11					
	severity	3					
fear of dying	order						
	severity						
nausea	order						
	severity						
chills	order						
	severity						
sweating	order						
	severity						
pounding heart	order						
	severity						
feeling irritable or cranky	order						
	severity						
weak or no energy	order						
	severity						
worried about having an attack	order		2	1			
	severity		5	3			
fear of losing control	order		14				
	severity		4				
dizziness, unsteady	order	12					
	severity	4					
hot flashes	order						
	severity						
tingling or pins and needles	order	10					
	severity	3					
fast heart	order	7					
	severity	3					
chest pain	order						
	severity						
shortness of breath	order	5	10	3		4	
	severity	3	4	4		3	
difficulty breathing	order	6	6	4			4
	severity	4	4	4			3
congestion	order						
	severity						

	Subject #	1	2	3	4	5	6
exhausted	order	13					
	severity	4					
numbness	order						
	severity						
feeling like things are not real	order						
	severity						
feeling unattached from oneself	order						
	severity						
smothering sensations	order						
	severity						
trembling or shaking	order						
	severity						
fear of being left alone	order						
	severity						
helpless	order		12				
	severity		2				
scared	order		13				
	severity		2				

Typical Asthma Symptom Episodes

	Subject #	1	2	3
SYMPTOM	**Total#Sym**	12	13	7
wheezing beathing in	order		2	
	severity		5	
wheezing breathing out	order	4	1	2
	severity	2	5	4
tightness in upper chest	order			
	severity			
tightness in lower chest	order	6		
	severity	4		
tightness in throat	order		4	
	severity		4	
hoarseness	order		5	
	severity		4	
fear of choking	order		10	
	severity		3	
actual choking	order		11	
	severity		3	
spitting up of food	order			
	severity			
need to cough to breathe	order		7	4
	severity		4	3
intestinal cramps	order			
	severity			
stomach cramps	order			
	severity			
cough	order	3	8	
	severity	3	5	
headache	order			7
	severity			4
tired	order			
	severity			
fear of dying	order			
	severity			

	Subject #	1	2	3
nausea	order			
	severity			
chills	order			
	severity			
sweating	order	10		
	severity	3		
pounding heart	order			
	severity			
feeling irritable or cranky	order			6
	severity			5
weak or no energy	order			
	severity			
worried about having an attack	order		6	
	severity		3	
fear of losing control	order		13	5
	severity		2	4
dizziness, unsteady	order	11		
	severity	2		
hot flashes	order			
	severity			
tingling or pins and needles	order			
	severity			
fast heart	order	9		
	severity	2		
chest pain	order	7		
	severity	3		
shortness of breath	order	1	9	
	severity	4	4	
difficulty breathing	order	5	3	3
	severity	4	4	4
congestion	order	2		1
	severity	4		3
exhausted	order	12		
	severity	2		
numbness	order			
	severity			

	Subject #	**1**	**2**	**3**
feeling like things are not real	order			
	severity			
feeling unattached from oneself	order			
	severity			
smothering sensations	order			
	severity			
trembling or shaking	order			
	severity			
fear of being left alone	order			
	severity			
helpless	order		12	
	severity		2	
scared	order	8		
	severity	2		

Typical Panic Symptom
Episodes

	Subject #	1	4
SYMPTOM	**Total#Sym**	16	None (See VCD/Panic)
wheezing beathing in	order		
	severity		
wheezing breathing out	order		
	severity		
tightness in upper chest	order	5	
	severity	2	
tightness in lower chest	order		
	severity		
tightness in throat	order	2	
	severity	3	
hoarseness	order		
	severity		
fear of choking	order		
	severity		
actual choking	order		
	severity		
spitting up of food	order	10	
	severity	1	
need to cough to breathe	order		
	severity		
intestinal cramps	order		
	severity		
stomach cramps	order		
	severity		
cough	order		
	severity		
headache	order		
	severity		

	Subject #	1	4
tired	order		
	severity		
fear of dying	order		
	severity		
nausea	order	9	
	severity	2	
chills	order	1	
	severity	3	
sweating	order		
	severity		
pounding heart	order	18	
	severity	3	
feeling irritable or cranky	order		
	severity		
weak or no energy	order		
	severity		
worried about having an attack	order		
	severity		
fear of losing control	order	8	
	severity	4	
dizziness, unsteady	order	7	
	severity	3	
hot flashes	order	1	
	severity	4	
tingling or pins and needles	order	6	
	severity	2	
fast heart	order	3	
	severity	3	
chest pain	order		
	severity		
shortness of breath	order		
	severity		

	Subject #	**1**	**4**
difficulty breathing	order		
	severity		
congestion	order		
	severity		
exhausted	order		
	severity		
numbness	order		
	severity		
feeling like things are not real	order	1	
	severity	3	
feeling unattached from oneself	order	1	
	severity	4	
smothering sensations	order		
	severity		
trembling or shaking	order	4	
	severity	3	
fear of being left alone	order		
	severity		
helpless	order	1	
	severity	4	
scared	order	1	
	severity	4	

Typical VCD / Panic Symptom Episodes

	Subject #	1	4
SYMPTOM	Total#Sym	16	19
wheezing beathing in	order	1	
	severity	3	
wheezing breathing out	order		
	severity		
tightness in upper chest	order		4
	severity		5
tightness in lower chest	order		
	severity		
tightness in throat	order	1	3
	severity	4	5
hoarseness	order	2	17
	severity	2	3
fear of choking	order		
	severity		
actual choking	order		
	severity		
spitting up of food	order		
	severity		
need to cough to breathe	order		
	severity		
intestinal cramps	order		14
	severity		5
stomach cramps	order		
	severity		
cough	order		
	severity		
headache	order		
	severity		

	Subject #	1	4
tired	order		
	severity		
fear of dying	order		7
	severity		3
nausea	order		11
	severity		5
chills	order		12
	severity		5
sweating	order		9
	severity		5
pounding heart	order	2	
	severity	3	
feeling irritable or cranky	order	2	
	severity	2	
weak or no energy	order		
	severity		
worried about having an attack	order		6
	severity		5
fear of losing control	order	2	
	severity	3	
dizziness, unsteady	order	2	
	severity	2	
hot flashes	order	2	
	severity	3	
tingling or pins and needles	order		10
	severity		3
fast heart	order	2	15
	severity	4	2
chest pain	order		
	severity		
shortness of breath	order	2	
	severity	3	

	Subject #	1	4
difficulty breathing	order	2	2
	severity	3	5
congestion	order		1
	severity		5
exhausted	order		18
	severity		5
numbness	order		16
	severity		2
feeling like things are not real	order	2	
	severity	4	
feeling unattached from oneself	order	2	
	severity	4	
smothering sensations	order		
	severity		
trembling or shaking	order	2	13
	severity	3	5
fear of being left alone	order		19
	severity		5
helpless	order	2	8
	severity	4	5
scared	order	2	5
	severity	5	5

		Typical VCD / Asthma Symptom Episodes			Typical V / A / P Symptom Episodes
	Subject #	1	2	3	1
SYMPTOM	Total#Sym	20	None	None	31
wheezing beathing in	order	6			5
	severity	4			5
wheezing breathing out	order	10			5
	severity	4			4
tightness in upper chest	order	5			5
	severity	4			4
tightness in lower chest	order	9			5
	severity	3			3
tightness in throat	order	3			5
	severity	5			4
hoarseness	order	2			6
	severity	4			4
fear of choking	order				20
	severity				4
actual choking	order				
	severity				
spitting up of food	order	20			25
	severity	2			2
need to cough to breathe	order				7
	severity				4
intestinal cramps	order				
	severity				
stomach cramps	order				
	severity				
cough	order	4			4
	severity	5			5
headache	order				24
	severity				2
tired	order	18			15
	severity	4			3
fear of dying	order				
	severity				

	Subject #	1	2	3	1
nausea	order				21
	severity				3
chills	order				14
	severity				3
sweating	order	13			8
	severity	4			3
pounding heart	order				
	severity				
feeling irritable or cranky	order	19			
	severity	4			
weak or no energy	order				16
	severity				3
worried about having an attack	order				
	severity				
fear of losing control	order				12
	severity				4
dizziness, unsteady	order	15			22
	severity	3			4
hot flashes	order	11			13
	severity	3			3
tingling or pins and needles	order	16			18
	severity	2			3
fast heart	order	12			10
	severity	4			3
chest pain	order	14			9
	severity	3			3
shortness of breath	order	8			2
	severity	4			5
difficulty breathing	order	7			3
	severity	5			5
congestion	order	1			1
	severity	3			4
exhausted	order				23
	severity				4
numbness	order				
	severity				

	Subject #	1	2	3	1
feeling like things are not real	order				12
	severity				4
feeling unattached from oneself	order				12
	severity				4
smothering sensations	order				
	severity				
trembling or shaking	order				17
	severity				4
fear of being left alone	order				
	severity				
helpless	order				19
	severity				4
scared	order	17			11
	severity	3			4

WORST SYMPTOM EPISODE

	Subject #	1	2	3	4	5	6
FINAL DIAGNOSTIC OUTCOME		Asthma	VCD	VCD	VCD/Panic	VCD	VCD
SYMPTOM	**Total#Sym**	14	18	12	18	11	9
wheezing beathing in	order	5	1			10	5
	severity	3	4			4	4
wheezing breathing out	order	3	2				6
	severity	5	5				4
tightness in upper chest	order	4	14		6	5	
	severity	4	3		5	4	
tightness in lower chest	order	8					
	severity	5					
tightness in throat	order		3	3	3	4	3
	severity		4	5	5	4	5
hoarseness	order		8		16	2	2
	severity		4		3	5	4
fear of choking	order		7	6			
	severity		3	3			
actual choking	order		10	7			
	severity		2	4			
spitting up of food	order						
	severity						
need to cough to breathe	order	10	5	8		9	
	severity	3	5	2		2	
intestinal cramps	order				12		
	severity				5		
stomach cramps	order						
	severity						
cough	order	7	6			3	1
	severity	4	5			5	5
headache	order		18				7
	severity		5				4

	Subject #	1	2	3	4	5	6
tired	order		13				
	severity		2				
fear of dying	order						
	severity						
nausea	order				8		
	severity				5		
chills	order				7		
	severity				5		
sweating	order	9		12	11		
	severity	4		2	5		
pounding heart	order			2			
	severity			2			
feeling irritable or cranky	order						
	severity						
weak or no energy	order	14				11	
	severity	3				3	
worried about having an attack	order		11	1	2		9
	severity		4	4	5		3
fear of losing control	order			10			
	severity			5			
dizziness, unsteady	order					8	
	severity					2	
hot flashes	order						
	severity						
tingling or pins and needles	order				10		
	severity				2		
fast heart	order				13		
	severity				3		
chest pain	order	11					
	severity	2					
shortness of breath	order	2	9	4	4	6	
	severity	5	4	5	3	4	

	Subject #	**1**	**2**	**3**	**4**	**5**	**6**
difficulty breathing	order	6	4	5		7	4
	severity	5	4	5		3	3
congestion	order	1	17		5		
	severity	5	2		4		
exhausted	order	13	15		15	1	8
	severity	2	2		5	2	4
numbness	order				14		
	severity				2		
feeling like things are not real	order				17		
	severity				5		
feeling unattached from oneself	order				18		
	severity				5		
smothering sensations	order						
	severity						
trembling or shaking	order				10		
	severity				5		
fear of being left alone	order				1		
	severity				5		
helpless	order		14	9			
	severity		3	4			
scared	order	12	12	11			
	severity	3	2	3			